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Hearings are now being taken in proceedings for forcing the Southern Railway to give up its present terminal site at Memphis, Tenn. Besides being of interest, because of the large amounts of money involved, these proceedings are a good illustration of demands often made on a railway company, demands which, though inherently unfair, can be supported by superficially good arguments. The Southern Railway acquired its terminals in Memphis before the Civil War through a charter granted to a company which has since been taken over by the Southern Railway. The city has grown up around these terminals, largely because jobbers and manufacturers, as well as shippers of all classes, found it convenient to be near the railway station. On one side of the

terminals, which are extensive and well adapted to their present use, lies the business section of Memphis. The business community finds the location of the terminals convenient and economical. On the other side lies a good residential section of the city, and the residents of this section now complain that the terminals, as now located, are a nuisance, and are seeking to have the city take the terminal property away from the railway and make it into a park. Of course, the city is to make some compensation to the railway company, and proposes to have the railway company establish new terminals at some other point. It must be borne in mind that the railway company did not originally build into the heart of a big city, but that the city grew up around the railway company's terminals. The question is, how far a railway company can be deprived of its property and ordered to make changes in its mode of operation, etc., because, through no fault of its own, it would now be more desirable from the point of view of adjoining property holders to have the terminals located somewhere else.

Prevention of accidents is a subject that has always taken a considerable share of every railway manager's attention, but never until now, so far as we can recall, has a road employed a man to make that his whole business, as the Chicago & Northwestern has done in appointing Mr. Richards to that task. (See April 1, page 905.) This course is logical, surely, for railway accidents are very destructive, both to property and to happiness; and so serious a disease demands the most expert doctor—that is, a specialist. The general manager, burdened with a great variety of other cares, is in somewhat the same situation as the family physician who has on his hands a dozen patients, each requiring a specialist in a different specialty. Specialist Richards differs, however, from the surgeon in that instead of himself cutting out appendixes or correcting deformities, he must try to instruct the sick person how to cure himself. If, as stated in the newspaper accounts, he is to inquire particularly into accidents which occur to employees from causes other than train accidents—that is, which are attributable usually to their own fault or the fault of a fellow employee—this is particularly true. In short, Mr. Richards is not a specialist in the prevention of accidents—there are too many kinds of accidents for anyone to attempt that role—but in the art of teaching other people how to qualify themselves as preventers. This is no easy job; and yet the lecturer, the inspector and the fault finder are by no means to be classed as useless or ornamental. Instruction in first aid to the injured has produced very definite results, as where a freight brakeman has saved the life of a man injured a hundred miles from a hospital. Instruction and reproof in the handling of explosives has reduced the railway death list from that cause immensely. Why should not instruction be proportionately successful in other lines? Doctor Richards cannot prevent a freight handler from dropping an anvil on his foot or a brakeman from falling off a car, but he can set men to thinking for themselves on these matters; and as regards many classes of accidents this is all that anyone can do. One of the best things that could be done for thousands of railway employees would be to compel them to read Mr. Richards' book on accidents at least six times, and to stand an examination on it.

In the Interstate Commerce Commission's conclusions in the exhaustive discussion of the substitution of tonnage at transit points there is one unconsciously naive comment on the question of agreement between railways in the making of rates. This comment made public by a commissioner so soon after section 7 of the administration railway bill has been dropped by Congress shows how ridiculous is the present law forbidding rate agreements and how unpractical is the attitude of Congress toward it. Commissioner Cockrell, in discussing competitive practices, says in his opinion: "The commission

is confident that if the carriers will join in the cancellation of the arrangements which they have built up for the purpose of withholding business from each other, they will be relatively as well off as they are now. * * * Our only comment on this would be to suggest that the words "will join" be put in italics.

The conclusions of the commission as to the abuse of the transit privilege are sound insofar as they attack present conditions, but its only suggestion as to how these conditions may be remedied is to point out the benefits that have been derived from the adoption of the flat rate at the Missouri river. In the abstract of the case published in our news columns we do not print any of the discussion of the various kinds of abuses that have arisen under the transit rules, because these discussions have been very fully covered by the article published in the April 29 issue of the *Railway Age Gazette*, page 1078. The position taken by the commission is simply that it intends to enforce, by criminal proceedings against railways and shippers, if necessary, the conference ruling made on June 29, 1909, but it leaves the method of carrying out this ruling entirely to railway managers.

The decision of the arbitrators in the case of the New York Central & Hudson River conductors and trainmen is published in another column. Its merits and faults need not be discussed. The test of time is better. The effect on the conductors of fast trains between New York and Buffalo of a daily wage of \$10.56 is worth watching with mild interest. The especial interest is in the personnel of the board which made the award. So it is worth while to follow the way these two men, who had been leaders of labor unions, conducted the proceedings. After the arbitrators had asked some questions so as to have it clearly understood exactly what questions they were to decide and whom their decisions would affect, A. B. Garrettson presented the case for the conductors. He took up one by one the changes asked by the employees, giving the reasons why they thought it just that they be granted. After rehearsing the history of the present movement to get the western wage scale in uniform operation on all roads in eastern territory, and giving his arguments for uniformity, he took up the proposals seriatim. W. G. Lee followed for the trainmen, speaking only of such particular points as Mr. Garrettson had not already covered in detail. A. H. Smith presented the railway's side. He began with a summary of the operating and competitive situation, earnings and recent improvements made by the New York Central. He pointed out that the work of conductors and trainmen was easier on a block signaled road than on other roads, showing how the New York Central is unique as an operating proposition, particularly concerning the work of employees. Mr. Morrissey said that he had never worked under block signals and asked questions as to the difference which this system made in the men's duties. A significant interchange on the subject of double heading occurred when Mr. Smith said he did not see why it was any harder on trainmen to ride behind two engines than one if the two engines did not pull a longer train than a single engine hauled over the greater part of the division. Mr. Lee thought that when an operating man made such a statement he did not feel that it required any answer. Mr. Smith said: "You are not going further into this then?" Mr. Lee said: "No," and Mr. Smith remarked, "I am disappointed." After Messrs. Garrettson and Lee had spoken again Mr. Smith spoke in rebuttal. W. C. Brown said that while the cost of living was now high, there were signs that it would soon decrease. It would not be fair to increase wages now to agree with the present cost of living because, as the labor leaders present knew as well as anybody, there would be a strike if they later tried to reduce wages to agree with the reduced cost of living. Throughout the hearings the attitude of the labor leaders toward the railway officers, and vice versa, was courteous and gave the impression that all the principals

were trying unselfishly to work out what was best for the community at large. The questions asked by the arbitrators were to the point and indicated a fair state of mind. When either side put in statistics, questions were asked to make clear exactly where the statistics came from and what importance was claimed for them. The accuracy of statistics given by the railway company was not disputed. Sometimes the arbitrators called on the labor representatives for statistics for which they turned and asked the railway officers, saying that they would accept the figures they found for them.

THE GRAND TRUNK IN CANADIAN POLITICS.

A great debate in a parliamentary body brings out facts and side lights on fact. Such a field-day of debate came in the Canadian House of Commons on April 28. Its subject was the Grand Trunk's project of building, with large government aid, its new transcontinental line from Moncton, N. B., to the Pacific; and the immediate motion before the House was a resolution of the opposition calling for a royal commission to investigate alleged abuses in the financing and construction of the line. Through some 60 large pages of that document of the Commons which corresponds to our own *Congressional Record* the long debate pours—so long, indeed, and with such copious arrays of figures that the compass of a single day's session seems too narrow. That the debate is laced through with partisanship and that the final vote upon the motion appears to have followed party lines rigidly rather adds to than subtracts from its material meanings.

The original and main facts in the case are that seven years ago the Grand Trunk Pacific, a child of the Grand Trunk, entered into a compact with the Canadian government for a great transcontinental line. There were to be two divisions—from Winnipeg westward and from Winnipeg eastward. On the westward division, for some 900 miles of prairie construction, Canada was to indorse the Grand Trunk Pacific securities at the rate of \$13,000 per mile and for the rest of the construction to the Pacific through the Rocky Mountains, some 850 miles, the government indorsement was to be at the rate of 75 per cent. of actual cost. The section from Winnipeg to Moncton, about 1,800 miles, Canada was to build herself and, when built, pass over to the Grand Trunk Pacific under a lease for 50 years. But for 7 years no rental was to be paid by the company and for the remaining 47 years 3 per cent. upon the cost of the division with interest added to the capital up to the date of transfer.

It is hard to condense nearly 60 pages of Canadian forensics into two paragraphs, but we take the plunge. The opposition leaders in their broad frontal attack charged that the Prime Minister, Sir Wilfrid Laurier, had, in 1903, asserted that the total money cost to Canada would be, finally, not more than \$13,000,000, which figure had since grown "to a fabulous sum"; that between Quebec and Winnipeg, 1,404 miles, a supposititious route of milk and honey, pasture and grain lands, had turned out barren rock; that original estimates of the cost of the line based on engineering guesswork had been vastly exceeded and thirteen contracts alone show a rise from \$37,340,723 to \$60,792,969; that the eastern division by itself would entail a gross outlay by the Canadian people of \$218,000,000, not including terminals and equipment; that the total cost of the whole transcontinental line (estimated) would be \$318,000,000, of which Canada would at the outset pay \$280,000,000 and again equipment and terminals not included; that the Grand Trunk Pacific with about a third the mileage of the Canadian Pacific would carry about the same fixed charges; that contracts for cuts showed in gross shape substitution of rock for soil for the benefit of the bidders; that the cost of four-tenths of the \$10,000,000 to build the new Quebec bridge had not been charged to the transcontinental line as it should be; that between Moncton and Quebec the new line paralleled

the governmental Intercolonial for 100 miles and would shorten distance but 28 miles to gain which the government would pay the same number of millions or \$1,000,000 a mile; that the government, while binding the offspring, the Grand Trunk Pacific, to favor Canada ports, had refused to bind the parent, the Grand Trunk, which could and would divert the new trade to Portland and its proposed new line to Providence, R. I., the latter line to cost \$10,000,000, and that the contracting corporation would very likely in the end abandon the unprofitable eastern division and let the government operate it.

To these allegations of opposition speakers the government chiefly replying, it must be allowed pretty weakly, through Mr. G. P. Graham, Minister of Railways and Canals, answered: That engineers' estimates and returns showed in one case opposition error of \$16,000,000, in another \$42,000,000; that the Quebec bridge was a project before there was any thought of the transcontinental railway; that careful preliminary engineering would have indefinitely delayed the building of the through line which the people of Canada had definitely approved and which the opposition itself had favored; that Portland and Providence would be ports only for the overflow of business; that what on this side of the border line we should call "graft" in excavation contracts, had been exaggerated; and that the attack of the opposition was unpatriotic and of a nature to embarrass the Grand Trunk Pacific in raising funds abroad. In the outcome the government showed that in place of specific rejoinders it had the votes. The motion for a royal commission was turned down by 105 nays to 62 yeas, Sir Wilfrid Laurier, who had not spoken in the debate, being present and voting with the nays.

All of which indicates that with the railway in politics things are doing above our northern border and other things are brewing. As one little corner of the future it will be interesting to note how government pledges of Providence as merely an "overflow" point will square with the Grand Trunk's recent assurance that that city will be a big terminal and main port. In wider aspects the Canadian case brings a kind of negative consolation to us on this side the Canadian boundary. Railway questions we have had, are having and shall have enough of in Congress and to spare. But among them are not the complications of federal subsidies for railways and the scandals of which the Credit Mobilier exposures of 1873 were the climax and end. Is our Canadian neighbor to pass through the same disciplinary experience?

THE "LONG AND SHORT HAUL" QUESTION.

The "long and short haul" question usually bobs up when regulation of railway rates is being considered. As might have been foreseen, some long and short haul amendments have been proposed to the federal administration's railway bill. We published the Heyburn amendment in our issue of April 22, page 1060. Its enactment would prohibit the charging of a higher rate for a shorter than for a longer haul over the same line in the same direction under any circumstances whatever. The amendment reported favorably by the House committee on Interstate and Foreign Commerce is not so stringent. It provides that it shall be unlawful to charge more for a shorter than for a longer haul over the same line or route, "or to charge any greater compensation as a through route than the aggregate of the local rates"; provided that the Interstate Commerce Commission may, in special cases, authorize a higher charge for a shorter than for a longer haul, and provided further, that no rates lawfully existing at the time of the passage of the proposed amendment shall be required to be changed by reason of its provisions prior to the expiration, of six months after its passage, nor in any case, where application shall have been filed with the commission, until a determination of such ap-

plication by the commission. Senator Bristow, of Kansas, made a long speech a few days ago, in which he cited numerous freight rates west of the Missouri river to show that the railways under the existing long and short haul clause are discriminating between communities. No one denies that the railways in many cases are charging lower rates for longer than for shorter hauls, or that this involves discrimination, and, in many instances, very great discrimination. The real question is not whether there is discrimination, or even great discrimination, but whether there is wilful, unfair and harmful discrimination.

If some of these gentlemen who talk so much about railway affairs and know so little about them would but recognize the fact that the traffic managers of railways are influenced by the same motives as other commercial human beings, they might get a better understanding of why they sometimes make lower rates for long than for short hauls. Men like Senator Bristow always assume that this must be due to the caprice, prejudice, cupidity or malevolence of the traffic manager. But railways and their traffic managers are not in business to display caprice or to vent malevolence. They are in business to make money. This being so, is it not as plain as a pike staff that if something did not prevent them they would always charge more for a longer than for a shorter haul, simply because a longer haul costs more? Our friends who cannot imagine the traffic manager being influenced by any but sinister motives reply that the real reason why he sometimes thus disregards distance is that he wants to build up some communities at the expense of others. But why should he want to build up one community on his road at the expense of another on his road? He wants to get the largest practicable revenue for his railway; and if, for example, he makes a lower rate to San Francisco than to Reno, Nev., it is not because he loves San Francisco more or Reno less, but because, owing to controlling water competition at San Francisco he cannot get as high a rate to San Francisco. If he could get the same aggregate amount of revenue by always charging a higher rate for a longer haul he would always do so. When he accepts a lower rate to a more distant point it is almost invariably due to controlling competition at the more distant point which is not met at the nearer point, and usually the controlling competition is water competition.

Critics of the traffic manager's method of making rates reply that if he voluntarily reduces the rate to the more distant point to meet competition he should be compelled to proportionately reduce the rates to intermediate points. To force him to adopt this policy is the purpose of the Heyburn amendment. If it were passed, the railways would have to choose whether they would raise their rates for the longer or reduce them for the shorter hauls. Which they would do would depend on which they thought would least reduce their earnings. The transcontinental roads probably would raise their rates to the Pacific coast. That would eliminate *railway discrimination*, but it would not remove the *discrimination in rates*, because the steamship lines would still make lower rates to the coast than the railways make to the interior. If those who favor the Heyburn amendment really want to stop discrimination what they should do is to advocate a law to prohibit the steamship lines from making lower rates to the coast than the railways make to the interior. The railways then would cheerfully raise their rates to the coast and reduce them to the interior, and the discrimination would be abolished. But what our lawmakers who want to "soak" the railways actually do is to pass laws for the building of the Panama canal and the development of other waterways to compete with the railways and to cause them to reduce their rates, and then wail because the roads fulfil expectations by meeting the low water rates, but without making equivalent reductions to points which the bounty of the government has not yet provided with waterways.

The amendment reported favorably by the House committee strikes out of the present section 4 of the act the words, "under substantially similar circumstances and conditions," which have been construed by the Supreme Court to give the railways the legal right to disregard the long and short haul clause when the circumstances of the hauls are, in the judgment of their managers, substantially dissimilar. The amendment, therefore, gives the commission complete power and discretion to determine when and where a lower rate may or may not be charged for a longer haul. It has been complained that the law as it stands gives the railways the power of "life and death" over communities. This is not true, but the proposed amendment would give this power to the commission. It seems probable the commission would construe the act as amended as in its early history it did the original interstate commerce act. It held then that market conditions and the competition of carriers were not sufficient to justify a higher charge for a shorter than for a longer haul. In the case of the San Bernardino Board of Trade versus A., T. & S. F., *et al*, it held that "the water competition which justifies a greater charge for a shorter distance by railways must be actual; possible competition will not justify such greater charge." These rulings were nullified by the Supreme Court, which said in one case: "Shall the government undertake the impossible but injurious task of making the commercial advantages of one place equal to those of another? It might as well attempt to equalize the intellectual powers of its people." If Congress should pass the proposed House amendment, the commission would be justified in assuming that Congress meant it to undertake this "impossible but injurious" task.

The enactment of the House amendment probably would be a less evil than the passage of the Heyburn amendment. The results, however, would depend mainly on the wisdom with which the commission administered the law. If it applied the long and short haul principle rigorously it would not only seriously reduce the revenues of many railways, but would greatly injure many commercial centers, without, however, stopping discrimination in freight rates. For, as we have said, that can never be stopped until the water lines are compelled to raise and keep their rates proportionately as high as the rates of the railways.

NEW BOOKS.

Cotton Mills of Alabama and Georgia. By H. E. Anschutz, C.E., Montgomery, Ala. Published by the author. Leatherette; 3 3/4 in. x 6 in.; map 20 in. x 30 in. Price, \$1.00.

This little booklet contains a map, on a scale of about 1 in. to 18 miles, of Alabama and Georgia, showing the location of cotton mills. Accompanying the map is an index giving the index number of the mill, the county and town in which it is located, the number of spindles in the mill, the cotton consumption and the kind of power used. Besides showing the cotton mills it shows the location of water-power plants.

The Earning Power of Railroads, 1910. Compiled and edited by Floyd W. Mundy, of James H. Oliphant & Co. Published by James H. Oliphant & Co., New York and Chicago 461 pages.

The 1910 edition of this book brings up-to-date statistics and facts relating to the earning power of nearly all the railways in the United States, Canada and Mexico. The introductory chapters explain the fundamental principles to be applied by the investor in studying the value of securities of a railway. The tables which follow give statistics as to earnings, mileage, capitalization, tonnage, etc. The figures given are in nearly every case taken from the annual reports of the railways, and are generally for the fiscal year ended June 30, 1909. The figures given are well selected and the book forms a handy reference for one wishing to obtain the main facts in regard to the present condition of railway properties.

Practical Talks on Contracting. Published by The Contractor Publishing Co., Chicago. Illustrated. Cloth; 6 in. x 9 in.; 128 pages. Price, \$1.50.

From time to time valuable articles on the administrative features of contracting work appear in *The Contractor*. The book under review is a compilation of the best of these. Frank B. Gilbreth presents his ideas on organization in an article entitled "Systematizing a Contractor's Office." E. S. Hanson makes a careful study of conditions and methods in an article entitled "Between Profit and Loss," and also writes on "How Contractors Use Photography." A. O. Davison, in four articles, describes organization and office system for construction work, points out important things to consider in estimating, and gives his experience in the operation of camps and commissaries. C. Arthur Worden discusses, in five articles, liability insurance; purchasing, tool and equipment records; daily reporting system; and earthwork records. The remarkable changes taking place in the business of the contractor are partly due to such books as this. The contractor is no longer the rough workman risen from the ranks, but is a high-grade business man. He knows that all of contracting is not comprised in the actual work of construction, but that the manager is a factor fully as important as the working superintendent. This book is a good example of modern educational tendencies. The authors of the articles are practical men; they describe conditions as they find them and tell what they do in their daily work to reduce loss and insure profits.

Contributed Papers.

REASONABLE FREIGHT RATE.

BY F. H. PLAISTED,

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I.

A common carrier, being a quasi-public concern, differs from strictly private concerns in two important particulars. (1) In selling its transportation the law permits it to discriminate between dissimilar things under the same conditions and between the same things under dissimilar conditions, but not between different persons or localities for carrying the same thing under the same conditions. (2) The law requires that the carrier's rates shall be *reasonable*, but has furnished no definition of reasonableness. Out of the widely different conceptions of *what is a reasonable rate* arise countless controversies.

COMMODITIES SOLD ON THE BASIS OF THEIR VALUE.

But if the business of the carrier differs from that of other concerns in the features just cited, it remains true that except for those limitations imposed by law and public policy, the carrier's business is just like any other business and, theories to the contrary notwithstanding, the application to it of rules or principles inapplicable to any other business will be found, if not impossible, at least ill-adapted to promote the welfare either of the carrier or the patron of the carrier.

The world's commodities are sold at prices based on value rather than cost. True, value has a relation to cost, as we shall see, still, generally speaking, it is proper to say of all commodities traded in by the people, railway transportation included, that the price to-day is fixed, not on basis of the cost to the seller, but rather of the value to the buyer. Experienced railway traffic men and many economists who have given the question careful study maintain that railway transportation, like any other commodity, can be sold in no other way on a basis fair to the shipper, fair to the carrier and meeting the ever-changing necessities of commerce. On the other hand, there are many American people who, ignoring

the rule governing the sale of all things else, contend that a different plant must apply to the business of the carrier and that the price of transportation shall be based solely on cost of service, the extremists advocating the European "zone" system or an out-and-out distance tariff, distance being a crude measure of cost of service.

Well convinced that as all trained railway men realize that the companies can permanently prosper only with their patrons, not at the expense of their patrons, so the studious and conservative element among the people equally realize that the public can permanently thrive only with the carriers, not at the expense of the carriers, and granting in the beginning general honesty of purpose on both sides of the controversy, who is to say whether the railway men or their critics know best? Between these two methods, so earnestly defended by opposing advocates, who is to decide? Believing that a frank statement of the reasons for the faith that is in us may assist toward a solution, we offer, from the railway point of view, these comments as to the merits of the two plans: cost of service vs. value of service as a basis for finding the reasonable freight rate.

IF COST OF SERVICE, WHAT COST?

It may be well to inquire at the outset what is meant by the term "cost of service" as used by the advocates of that plan? There are at least two bases for figuring cost of service in the running affairs of every concern:

(1) The entire cost of conducting the enterprise, which must include not only general cost of maintenance, operation and administration, but taxes, insurance, depreciation and other expense incident to operation, as well as so-called "fixed" charges (interest and the like): all items, in short, which go to make up the total burden and charge against the business. Of these some will vary with the volume of business done; others will remain the same and yet others nearly the same whether the plant is run to full capacity or not.

(2) Additional cost of doing additional business, as, in the case of a railway, of running an additional train; hauling an additional car; securing additional tonnage for a car which is being hauled or loaded; obtaining "back" loads for cars otherwise returning empty, etc.

For brevity these two bases will hereafter be designated as "entire cost" and "additional cost." They are two very different things, and as it is well for the truth seeker in the beginning to avoid confusion of terms, it is hoped, without going further into detail at this time, that the difference is manifest.

There are those who have reasoned that the lowest rate per ton per mile in effect anywhere on a railway may be assumed to cover at least the cost of the service, and that it would be fair to use this as a basis for rate making generally. Such reasoning is misleading. If by "cost of service" they mean to say "entire cost," then they are completely mistaken in believing that any abnormally low rate found to be in effect may be assumed to cover that; if they mean only additional cost of doing additional business, then they are generally correct so far, but to conclude from that that it will do to predicate rates generally on such a basis, one must first be able to believe that fixed charges, general maintenance charges and other items making up the entire cost of running a railway, but which are omitted in figuring additional cost of additional business, will get themselves paid in some way without any provision for raising the sum necessary out of the revenues of the business.

The cost of transportation per unit, say for hauling one ton one mile, using in the calculation merely additional cost of handling the additional ton, is necessarily much lower than the cost per unit if we mean entire cost of maintaining the enterprise. Additional cost, plus a profit, which, though small, may prove attractive to the carrier in disposing of surplus capacity and at the same time affording a necessary assistance

to the business of a dependent producer, may yet well be, and in fact generally is, considerably below the figure required to meet the entire average cost of conducting the business. Hence, to say that abnormal rates, based on additional cost plus a small profit, may be assumed to cover entire cost, and may therefore be used as a measure for making all rates, is to assume that which is untrue and conclude that which is unfair. That the disposition to draw this unwarranted conclusion often acts as a deterrent to the carriers in affording necessary assistance to production which they might otherwise afford cannot be doubted.

GENERALITIES WILL NOT ANSWER.

If the business of railroading is to prosper and the demands of an expanding commerce are to be provided for, the returns from the entire volume of transportation sold must cover the entire cost of conducting the business plus a profit sufficient to attract the investment of the necessary additional capital, i. e., equal to the returns from other gainful occupations where the risk is no greater. That much is probably apparent without argument to support it. It is as true of the railway as of any other business.

But while it is easy to speak in averages and to agree upon generalities, is it, after all, very much to the purpose? John Doe, being told that the average of freight rates in America is lower than in Europe, replies that he is gratified to learn that that is so, but insists, nevertheless, that his freight rate is too high. Asked why he thinks so, he says that it is "because Richard Roe pays less"; and there we have the trouble in concrete form, which is not to be disposed of by any statement of generalities. It is not the body of rates, generally, that is challenged; it is the individual rate or the relation of rates. How is the rate in which John Doe is interested to be adjusted fairly with relation to other rates? Here we have thousands of John Does and Richard Roes interested in the movements of hundreds of different commodities and in hundreds of different movements of the same commodity. How is the price for these services to be apportioned on a basis fair to all? That is the problem and it is here it becomes necessary to leave averages and plunge into concrete things.

"ADDITIONAL COST" THE BASIS OF BUSINESS EXTENSION.

The object of the entire body of rates is to earn the cost of the service plus a fair profit, but while one rate is a normal rate, based on entire cost, another is an abnormal rate, based on additional cost, and which cost will form the basis depends upon the value of the service to him who buys it. When the traffic man figures close, as frequently he must in seeking to extend his business and protect the interests of the producer in his territory, in thinking of cost of service it is additional cost he has in mind as marking his danger line. From that he reasons just as the salesman of any other commodity reasons. The producer of the commodity offers the producer of the transportation what he considers to be the value of the service to him. That is, if he finds the rate in effect does not permit him to reach the desired market, he endeavors to demonstrate the fact to the railway traffic man, and his statement is that the rate is "prohibitive" or that his "business cannot stand" more than so and so. In other words, that if its price is marked at more than such a figure it will be more than its value to him, the transaction will not be made and the additional business will not be done. The transaction is just like any other transaction in merchandising. If the value of the service offers a profit over entire cost the railway salesman is well satisfied, indeed; if it be below that, yet promising some margin over additional cost of undertaking additional business, a bargain is usually struck and the necessary rate made. That is especially likely to be so if there are incidental benefits; as continued operation of a mine or manufacturing plant if the lower rate is established, where the alternative might mean a shut-down, because both the carrier and the community realize revenues in other ways by reason of such operations; the establishment of a new industry in the

territory, which aids development and brings other earnings to the carrier as an incident to its activities; the saving of a surplus agricultural product, as hay or fruit or vegetables, which, otherwise unsalable, would spoil and waste, yielding no returns to the producer and no business to the carrier, while if sold and hauled at some price, this value will be preserved to the producer and there will be in addition to the small profit out of the rate made for it, return hauls of other commodities purchased with these values to augment the business of the railway. Examples might be multiplied of these inducements to the traffic manager to sell his transportation at abnormally low rates, often dangerously near to the additional cost of doing the additional business.

The two principal counter influences are: First—The knowledge, ever present, that as all traffic cannot be carried on that basis, such adjustments must be undertaken only when the necessity for them is clearly demonstrated; and, second, the danger, also ever present, that pseudo-economists and not over-careful critics generally, challenging rates always by comparison, may be able, by citing some abnormal rate made because it was necessary, to force rates elsewhere to an abnormal basis when it is not necessary, i. e., where the necessity of the producer is served by the normal rate.

WATER AND MARKET COMPETITION.

Two of the prominent moving causes to the establishment of abnormal rates, based on additional cost, are: First, the existence at certain points of the competition of water carriers, either actually present, or, as defined by the commission and the courts, "potential," that is possible in case rail rates are not based so as to prevent it; or, second, market competition, being the competition of other producers of similar articles so situated as to cheaper cost of their output, proximity to the market or cheaper transportation to the market that the producer dependent upon the carrier for his entrance to such markets must receive its utmost assistance to reach them, i. e., the carrier as well as the producer himself must make close prices, basing them on additional cost only, in order to enable such business to be done at all.

The situation at the Pacific coast terminals and at many other points in the country presents both of these aspects; that of water competition which impels the carriers leading from the Atlantic to the Pacific to meet the competition of the ships, and that of market competition which induces the same or other carriers to equalize the interior producer by making the same rates, although in that case no water competition, as such, actually exists. In that state of things it devolves upon the carrier either to assist the producer dependent upon it for entrance to such markets in equalizing his price there so far as it can, or see the industry on its own line excluded therefrom. Yet when the railways have met that responsibility, to the incalculable benefit of producing communities all over the country, it has been received, not with praise that the carriers should have reduced some of their profits to the lowest possible limit where it was necessary in order that production might be fostered and widely diffused, but rather with bitter criticism that they would not therefore similarly reduce all their profits, whether it was necessary from the standpoint of the producer or not, and so go bankrupt.

POLICY FOLLOWED HAS MADE THE NATION GREAT.

It is the fact that the railways have realized their responsibility and met that situation that has made the country great; has made it grow in the interior as well as along the coast line as no country ever did before or ever could under any other policy, "Zone" system, distance tariff or what not. It is the effort to cripple the carriers' ability to continue that policy by attempting to use the cheapest rates resulting from it anywhere as the measure and maximum of all railway revenues which threatens the continuance of the nation's commercial and industrial welfare. Some railway critic has said that the practice of the railways in making abnormal rates,

to meet water competition, from coast to coast, and other abnormal rates, to meet market competition, from the interior to the coast is forcing this country to "run to fringe." Is not the fact the other way about? If there were no railways the country would be nothing but fringe; densely populated only along the coast or the rivers. That much seems apparent. It is believed it is safe, also, to assert that if it were not for the policy of the railways to afford the interior producer his outlet to coast markets by basing rates when necessary on additional cost only, the result would be very much the same: the great interior empire would be bottled and would languish. That it has not done so; that the producer throughout the whole land is prospering, as no producer in any other country ever prospered; that even the ever-complaining jobber, having prosperous producers to whom to sell, is also prospering; that the whole country is growing and developing commercially and industrially as no land ever did elsewhere, ought to serve in some measure to justify the method of railway rate making which has been in vogue, to admonish caution against hurrying too rashly into the adoption of some other undemonstrated method, and to some extent to mollify the railway critic and induce him to see the justice of allowing the carrier a liberal share in the prosperity which its policy has been so potent in assisting to create.

THE RATE, TO BE REASONABLE, NEED NOT BE ALWAYS THE SAME.

Must a freight rate, in order to be reasonable, be always the same? Evidently not. It undergoes wide variations, some of which, being understood, are approved; while others, being misunderstood, are condemned.

The rate may vary on different articles for the same distance, according to weight, bulk, volume of movement, market value, etc. This is understood and sanctioned. It may vary for the same commodity for different distances, and that is approved so long as the rate rises with the distance. When, however, because of the necessity of the producer as against market competition, or because the carrier is compelled by water competition, abnormal rates, based with reference to additional cost only, are established, lower for the longer distance than the normal rate for the intermediate shorter distance, that is not comprehended and is criticised and denounced.

HIGH GRADE AND LOW GRADE TRAFFIC.

There are commodities which are low grade commodities because they sell for low prices. There are markets which are low grade markets because they are markets of low price levels, not only of many commodities, but of wages, including what the railway buys there as well as what it sells there—the result of conditions to which the railway must adjust its business and assist in adjusting the business of its dependent producer, but which it cannot control or attempt to reproduce elsewhere under different circumstances. Traffic may be low grade, (1) because the commodity carried is a low grade commodity, or (2) because the market to which it is carried is, with reference to that commodity at least, a low grade market. Traffic may be high grade because of the reverse of these states of things. Traffic which is low grade from either cause necessitates the establishment of abnormal rates, based on additional cost only, or the business of the carrier, as well as of the producer dependent upon it, must suffer loss; a loss, be it understood, which cannot benefit the shipper of high grade traffic, be it a higher valued commodity or a commodity moving to a higher grade market.

When higher rates, based a margin over entire cost, are charged on valuable commodities, while lower rates, based a margin over additional cost, are applied on heavy, cheap commodities, because otherwise the producer of the low grade article could not move it at all, the public seems to understand why that class of traffic may be taken at less than its full share of entire cost. It does not think because of that that the carrier should reduce all other rates to the same basis. But when there is other traffic which is low grade because of

commercial conditions, and for which the carrier is also compelled to make abnormal rates, based a margin above additional cost, or lose the business both for itself and its dependent producer, that is viewed in an entirely different light. Abnormal rates on that traffic, although not made from choice, but for the same compelling reason as in the other case, arouse the demand for the same rates on all traffic. How is it possible to make this matter clearer?

Although, barring the minor element of insurance, the cost of haulage is precisely the same, no complaint is heard because a car of dressed stone pays more freight than a car of rough stone; a car of high grade ore more than a car of low grade ore; a car of merchant bar iron more than a car of scrap iron; but when, similarly, traffic the ships would otherwise take, or an article produced in the interior which could not otherwise move to markets where the price is set by similar articles reaching there by water, is taken at abnormal rates, based on additional cost only, because if not taken at such rates it cannot be taken at all—what then? Loud protests unless the carrier stands ready to duplicate that basis on all its business, which it cannot do any more than any other concern could measure the profits of all its transactions by the profits of its cheapest transaction.

WHERE IS THE DIFFERENCE?

Will not some advocate of the universal cost of service doctrine please point out the difference between hauling a car of scrap iron 1,000 miles for a less rate than is charged for hauling a car of merchant bar iron 500 miles; and hauling a car of bar iron 1,000 miles to a market where the price is set by the same article reaching there by water at a less rate than is charged for hauling bar iron 500 miles to an intermediate market where the producer does not meet such competition and hence is able to pay the normal rate? Both these adjustments are made under the value of service plan. Since the cost of service advocates condemn the one, why do they not also condemn the other? What constitutes the difference? Under the cost of service basis a car of scrap iron moved 1,000 miles should pay double the rate for moving a car of bar iron 500 miles. Why doesn't it? Because the value of the service is less, and if the rate were not made on that basis the business would not move at all. The fact that such a rate is made where it is necessary, however, furnishes no reason why it must also be made when it is not necessary, which is just as true of the bar iron moving 1,000 miles to the coast market compared with the bar iron moving 500 miles to an interior market, as it is of scrap iron moving 1,000 miles to a scrap iron market compared with bar iron moving 500 miles to a bar iron market.

PRICES OF TRANSPORTATION ARE MADE IN THE SAME WAY THAT OTHER PRICES ARE MADE.

The carriers have always used the same method in marketing their commodity employed by other concerns in marketing other commodities. They have based their prices on the value of the service to the purchaser. We insist that not only is this the same method used by all others and that we are not different from others, but that it is the only policy under which the development of this country could have taken place and its diversified resources have been utilized, as well as being the only method of rate making which is logical and which, under the constant action of competitive productive forces, equalizes and counterbalances itself.

Value of the service, as used in fixing the price of transportation, means, roughly, fixing it at the delivered value of the article transported, less its F. O. B. cost and a profit sufficient to attract capital to its production. Having ascertained what that is, the traffic man is quickly able to determine whether his company can afford to engage in the transaction; whether, by joining hands, the producer of the commodity and the producer of the transportation will be able to enter a new field and extend the business of both. Generally speaking, that is the way in which a large proportion of rates are made; all

rates, in fact, where we are seeking, as we usually are, to build up the territory and extend its business, and it is precisely the same method employed by those marketing other commodities and building up the business of other enterprises.

We build upon a foundation of *normal* rates, applying on traffic flowing in or out as an incident to the territory's productive activities, a superstructure of *abnormal* rates calculated to enlarge and extend those activities and consequently our own business and revenues as well as the business and revenues of the communities served. We believe the quarrel the people who share in the benefits of that policy think they have with us because of it can proceed only from misapprehension which it is the object of this article to remove. We sell as others sell on the basis of the value of what we have to sell. True, there is a large number of higher priced articles which move at rates away below the value of the service so calculated, but in striving to extend the business we hover continually between cost of service (figured more frequently than not on additional cost merely) and value of the service. When there is a margin ever so slight we generally attempt to enter the field.

PLAN IS ITS OWN CHECK AGAINST ABUSE.

That policy, pursued by every railway on practically every commodity, at least every heavy, important commodity, of commerce, is what welds the nation into an industrial whole and makes every section of the country competitive. This is true even as to points entirely local to one line, because other lines and producers on other lines, striving to extend their business and pressing for entrance into local territory, having reciprocal benefits to offer and controlling other competitive tonnage which they use as a leverage, generally succeed in securing the same treatment in local territories as elsewhere. Thus this method of rate-making, while fostering the diffusion of production and the activities of the producer, automatically protects the interests of the consumer by widening his choice of market, and while furnishing the maximum of elasticity and affording the freest possible movement of commerce, is its own check against its abuse.

(To be continued.)

SNOW REMOVAL BY STEAM HEAT.

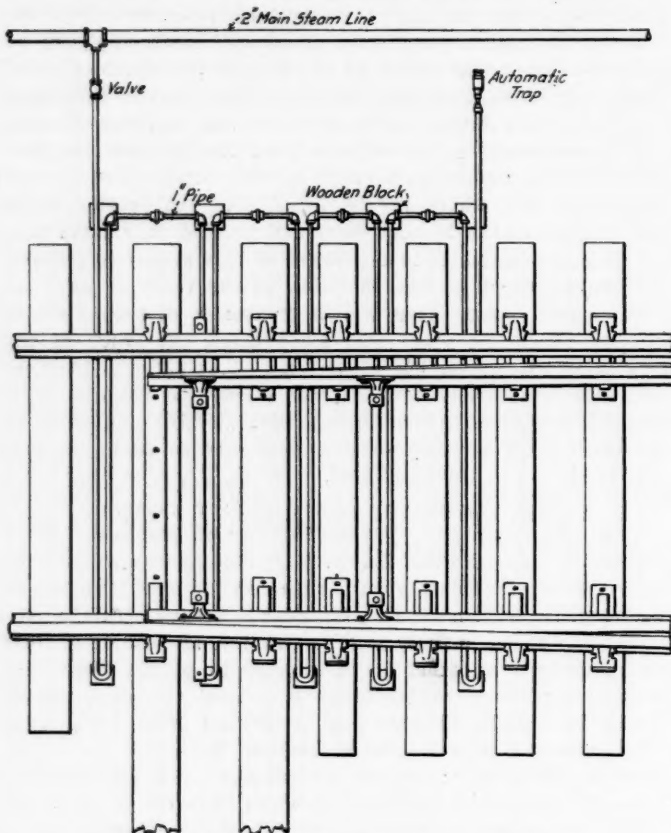
Trying to keep switches open by the use of brooms and shovels and by the application of salt, while effective in a storm of small proportions, is often futile in a blizzard of several days duration, even when a large body of men are employed with these tools. This is particularly true in terminal yards and at busy junction points where lack of room, the large number of switches and slip crossings, and perhaps difficulty in getting enough men, make it almost impossible to keep pace with the storm. The use of steam, gas or other heating agent for melting snow is not a new idea, but its mode of application and its effectiveness is always of interest. We are indebted to J. W. Foote, division engineer of the Erie Railroad at Jersey City, N. J., for the following information:

At the Erie Railroad terminal at Jersey City a system of steam pipes has been installed with decided effect. The steam is obtained from the power house in the Jersey City yard through a two-inch main and thence carried by one-inch pipes to each switch, two lines of pipe being placed between the switch ties under the points, the ballast first being removed. Automatic traps are placed to allow the condensed steam to run off, preventing freezing.

The plant was installed at a comparatively low cost to cover 26 sets of points and has been in service three years with excellent results. Throughout the several severe storms of the winter 1909-1910 the operation of the terminal interlocking plant was uninterrupted, and only a small force of men were required to clean the pipe lines and detector bars of the plant. The snow melts as it falls and no attention to

the points is required. The cost of maintenance is small, and but little steam is required to render the system effective.

The layout shown by the accompanying sketch could be ex-



Steam Piping at Switch Points.

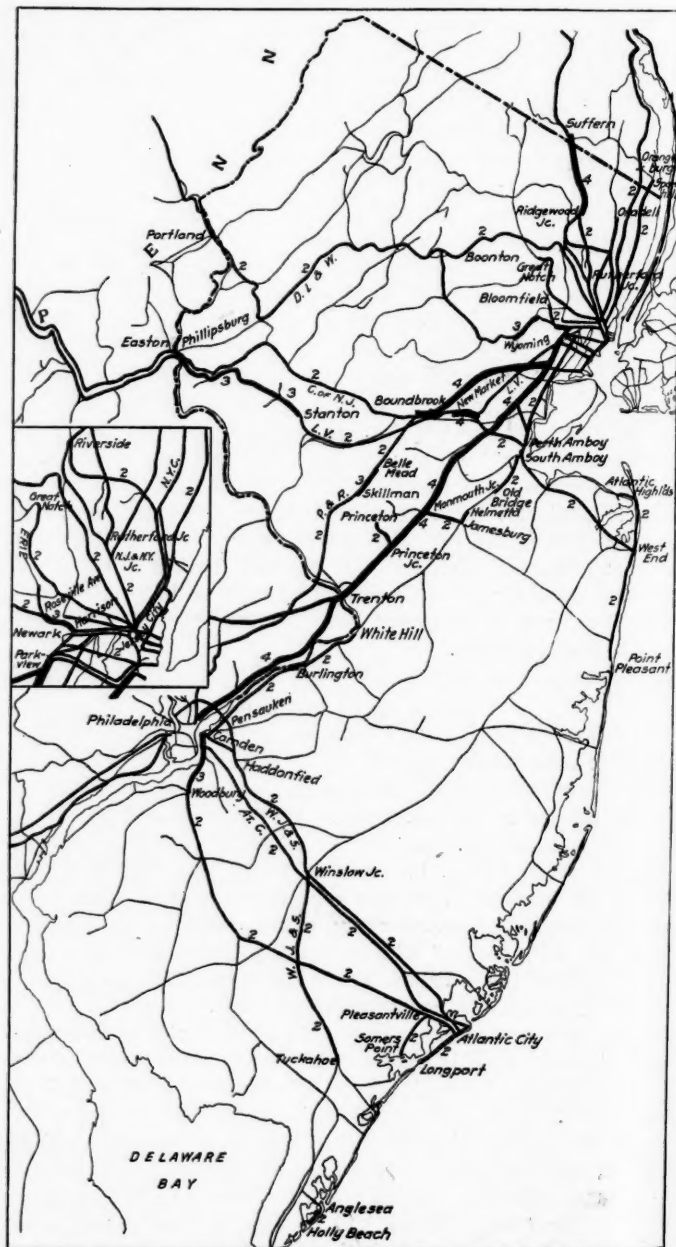
tended to cover the detector bars and pipe runs of mechanical interlocking plants, the greatest source of trouble in a storm. This would make the maintenance of the plant practically automatic.

MULTIPLE TRACK RAILWAY LINES IN NEW JERSEY.

The map given herewith has been made to show the two-track, three-track and four-track railways in the state of New Jersey. In the small rectangle in the left central portion of the diagram the lines in and near Jersey City are shown on a larger scale. Similar maps of other eastern states have been printed in previous issues. The termini of the sections of line having more than one track are as follows:

NEW JERSEY.		No. tracks.	Approx. miles.
<i>Central of New Jersey.</i>			
Jersey City to Bound Brook	4	30	
Bound Brook to Easton, Pa.	2	43	
Newark to Jersey City	2	7	
Newark to Perth Amboy	2	16	
Perth Amboy to Point Pleasant	2	38	
Atlantic Highlands to West End	2	10	
<i>Delaware, Lackawanna & Western.</i>			
Hoboken to Portland, Pa. (except as shown in next five lines)	2	..	
Hoboken to West End Tunnel	4	1	
West End Tunnel to Harrison	2	7	
Harrison to Roseville avenue	3	2	
Roseville avenue to Highland avenue	2	4	
Highland avenue to Wyoming	3	2	
Wyoming to junction with Boonton line	2	13	
Roseville avenue to Bloomfield	2	6	
Chester Junction to Port Morris	3	4	
<i>Erie.</i>			
Bergen Junction to Sparkill, N. Y.	2	24	
West End to Riverside	2	17	
Jersey City to Ridgewood Junction	2	16	
Ridgewood Junction to Suffern, N. Y.	4	11	
Rutherford Junction to Ridgewood Junction	2	10	
Rutherford Junction to Oxadell	2	11	
G. L. Junction to Great Notch	2	14	
Bergen Junction to Newark	2	7	
<i>Lehigh Valley.</i>			
W. Newark Junction to Potters	2	2	
Potters to Newmarket	4	16	
Newmarket to Stanton	2	24	

	No. tracks.	Approx. miles.
Stanton to Phillipsburg	3	23
South Plainfield to Perth Amboy	2	9
Newark to Jersey City	2	8
Pennsylvania.		
Jersey City to Newark	2	8
Newark to Trenton	4	48
Newark to Jersey City (N. Y. Bay R.R.)	2	7
Newark to Meadows (freight)	2	5
Rahway to Perth Amboy	2	7
Princeton Junction to Princeton	2	3
Frankford avenue, Phila., to Pensauken	2	2
Pensauken to West Haddonfield	2	7
Camden to Burlington	2	18
East Burlington to White Hill	2	8
Jamesburg to Helmetta	2	2
Old Bridge to South Amboy	2	7
Monmouth Junction to Jamesburg	2	6
New York Central (West Shore).		
Weehawken to Dumont	2	13
Dumont to Haworth	2	3
Haworth to West Norwood	2	3
West Norwood to Tappan, N. Y.	2	2
West Jersey & Seashore.		
Camden to Atlantic City	2	59
Atlantic City to Longport	2	7
Camden to Woodbury	3	9
Woodbury to Atlantic City	2	56
Pleasantville to Somers Point	2	7
Anglesea to Holly Beach	2	2
Atlantic City.		
Camden to Atlantic City	2	56
Winslow Junction to Tuckahoe	2	27
Philadelphia & Reading.		
Bound Brook to Belle Mead	2	10
Belle Mead to Skillman	3	4
Skillman to Pennsylvania boundary	2	25



Multiple-Track Railways in New Jersey.

TRANSPORTATION AND HANDLING OF STEAM COAL.

The committee on fuel supply of the Boston Chamber of Commerce has published a report on the buying and handling of steam coal, which was prepared to be of use to manufacturers and large coal consumers in selecting the coal best suited to their needs and in having it transported and handled by the most economical methods.

The committee on fuel supply was appointed in September, 1908, and its duties were outlined as follows: "To consider the fuel supply of New England—its source, quality and quantity, and questions affecting its cheaper production and supply; also the most approved means and appliances for the economic consumption of fuel." With these objects in view, the committee felt that an important part of its duty was to furnish all the information available to enable the consumers to obtain heat and power at a minimum cost, and to encourage the use of modern methods in the handling of fuels.

The field of work thus laid out was so broad that the committee decided to discuss one portion of it at a time, confining its first report to a study of the quality of the steam coals* and the method of their transportation.

This report gives a comprehensive survey of the rate situation with comparisons shown graphically by maps; tables of analyses of coals from the various districts that supply New England; production and consumption statistics, and other information of interest to coal consumers. The report is intended to illustrate to consumers the value of an intimate knowledge of the rate situation, transportation facilities, and the quality and freight cost of the different kinds of coal; and it is hoped that the report may be found useful as a handbook.

During the last 20 or 30 years coal has become of increasingly greater importance, not only to our industries but to our every-day life, and there seems to be every indication that this rapid growth will continue. A great increase has occurred at the same time in the use of electricity for light and traction until it has now, to a great extent, revolutionized the more antiquated systems of lighting, and has replaced the use of horses in our street railway traffic; in addition, there has been considerable substitution of steam and electric power for manual labor, and as auxiliary to water power. In the last ten years the mileage in electric railways in New England has increased from 2,220 miles in 1897 to 4,795 miles in 1907, or 116 per cent.; and the total production of electricity has increased to a much greater extent; this, coupled with the general increase in the use of power to supply the conveniences of every-day life, has caused the consumption of coal in New England to increase much more rapidly than the value of manufactured products.

	1900	1905	Increase	Per cent. of Increase
Maine	\$112,959,098	\$144,020,197	\$31,061,099	27.5
New Hampshire.....	107,590,803	123,610,904	16,020,101	14.9
Vermont	51,515,228	63,083,611	11,568,383	22.5
Massachusetts.....	907,626,439	1,124,092,051	216,465,612	23.8
Rhode Island.....	165,550,382	202,109,583	36,559,201	22.1
Connecticut.....	315,106,150	369,082,091	53,975,941	17.1
New England.....	\$1,660,348,100	\$2,025,908,437	\$365,650,337	22.0

(Compiled from U. S. Census Report on Manufactures, 1905)

Value of Manufactured Products in New England.

In 1908 New England's total coal consumption was about 24,000,000 tons for which over \$100,000,000 was paid. Exact statistics for previous years are not obtainable, but it has been estimated that there was an increase of approximately 100 per cent. in steam coal consumption in the ten years from 1898 to 1908.

An analysis of the expenditure of \$100,000,000 shows that in

*In addition to bituminous coal, the sizes of anthracite known as No. 2 and No. 3 buckwheat are included under the heading of steam coals in this report.

round numbers only about \$30,000,000 was paid for this coal at the mouth of the mine, while the remaining \$70,000,000 was paid to the transportation companies and coal dealers for the delivery of the coal to the consumer.

	Anthracite	Bituminous	Total
Coal tonnage discharged at New England ports	5,095,518	10,917,029**	16,012,547
Coal tonnage received all rail	3,512,059	4,547,294**	8,059,353
Total tonnage.....	8,607,577	15,464,323	24,071,900

Includes railroad supply coal.

New England's Coal Consumption in 1898.

This high proportion of freight cost is due to the distance from the coal fields to New England and makes the problem one of great importance to our manufacturers. A consumer of coal in New England must bear in mind the large proportion of the total cost of fuel which the freight rate constitutes and must consider the quality of coal the more carefully. He must avoid paying a high freight rate on an inferior grade of coal, unless the price at the mines is enough lower to net him more available heat value per dollar than if the better coal were purchased. On the other hand, it must be remembered that the quality of some of the higher priced coals is not always proportionate to the price asked, so it is not always true that either the lowest priced coal on the one hand or the "best" coal on the other is the most economical to buy.

The importance of the relation between the cost of transportation and the quality of coal cannot be too strongly emphasized, as when a sufficiently high freight rate is paid, the better the coal the more economical it is. The relation between the quality of two coals remains constant regardless of price or freight, while the delivered prices grow proportionately closer as the freight becomes greater. The following case illustrates this relation:

B. t. u.*	Ratio of Quality	Price at Mines	Ratio of prices at Mines	Price at Mines + Freight	Delivered Price	Ratio of Delivered Prices
A 13500	= 93.1	\$1.05	= 84	\$1.05 + \$1.50	= \$2.55	= 92.7
B 14500	= 100	1.25	= 100	1.25 + 1.50	= 2.75	= 100
				or \$1.05 + \$2.25	= \$3.30	= 94.3
				1.25 + 2.25	= 3.50	= 100
				or \$1.05 + \$3.00	= \$4.05	= 95.3
				1.25 + 3.00	= 4.25	= 100

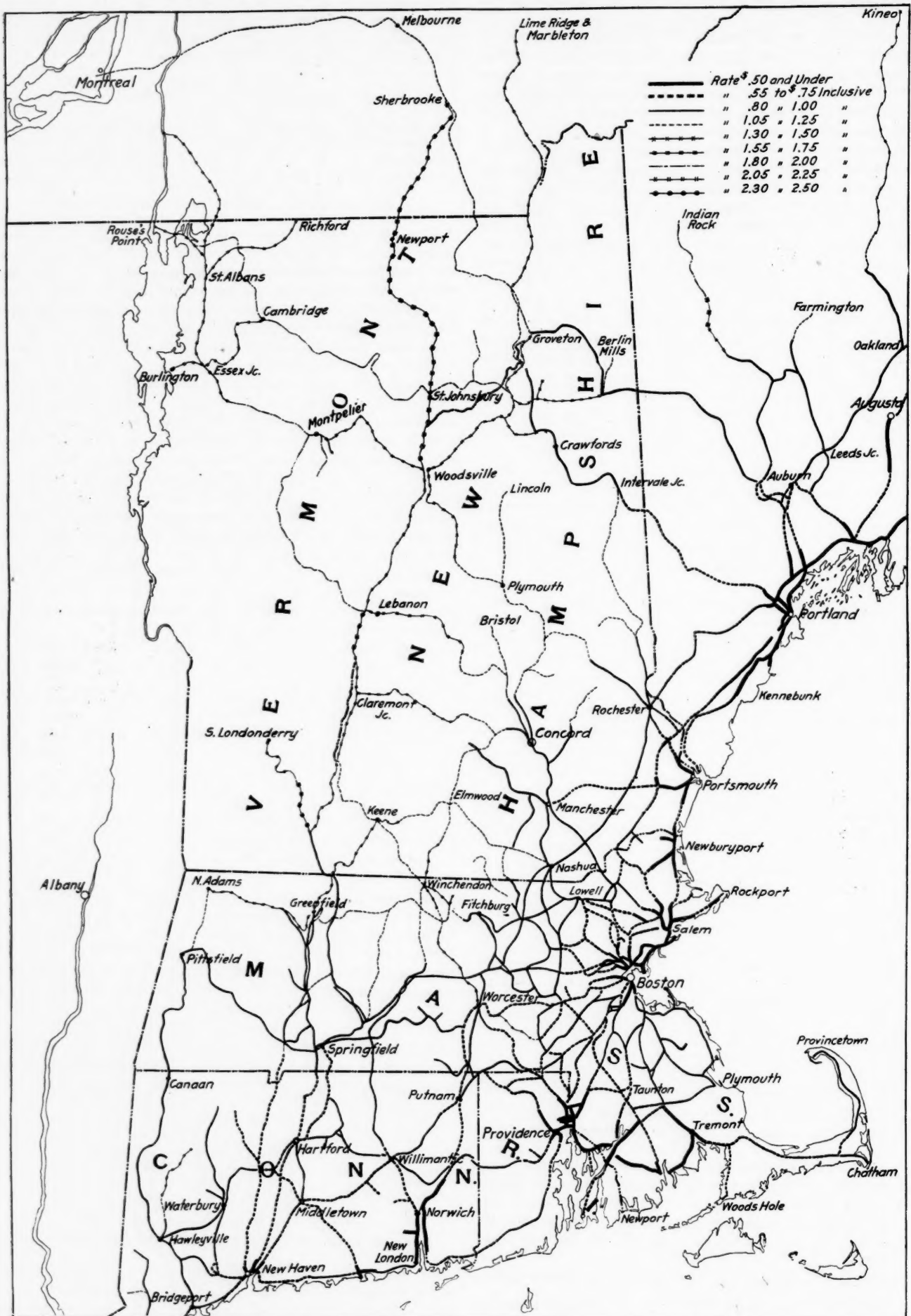
In the case above cited a coal containing 13,500 B.t.u. (A) sells at mine for \$1.05, and one containing 14,500 B.t.u. (B) sells at mine for \$1.25, the B.t.u. in A being 93.1 per cent. of the B.t.u. in B, while the mine price of A is 84 per cent. of the mine price of B. It is clear from this that for ordinary steam purposes, it having been assumed in this particular example that the value of the coal is based on the B.t.u., the lower grade coal A is much more economical at the mine than B. However, when a freight rate of \$1.50 is paid on both A and B, the ratio of the delivery price rises to 92.7 per cent., very nearly corresponding to the B.t.u. ratio, so that the advantage in favor of the lower grade coal is practically wiped out, and when a freight rate of \$3 is paid, which is not far from the average freight rate from the mines to interior New England points, the ratio

	1903	1904	1905	1906	1907	1908
Pennsylvania bituminous.....	\$1.32	\$1.08	\$1.08	\$1.12	\$1.16	\$1.13
Maryland	1.66	1.33	1.28	1.33	1.34	1.31
West Virginia.....	1.31	.99	.96	1.06	1.11	1.06
Pennsylvania anthracite.....	2.28	2.13	2.05	2.07	2.14	2.13

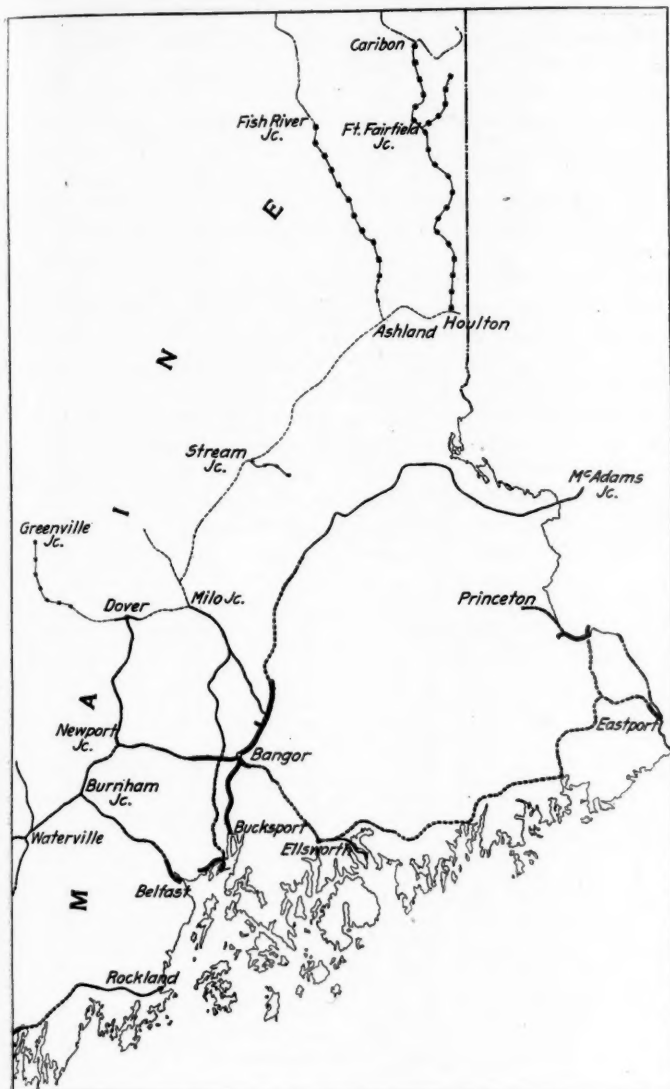
Compiled from U. S. Geological Survey "Mineral Resources of the U. S."—1908.

Average Price of Coal at Mines, 1903-'08, by States.

rises to 95.3 per cent., thus making the higher grade coal the more economical. Similar instances might be cited in which the relation of price to B.t.u. would vary from the one quoted, but the above is shown simply as a typical example



Map of New England States, Showing Rates from New England Tidewater on Bituminous Coal.



Portion of Tidewater Rate Map.

of the difference in relations between high and low grade coals according to the amount of freight paid.

COAL ROUTES AND RATES.

In order to give a clear idea of the basis upon which New England's coal rates are made, a brief outline of the routes by which bituminous coal reaches us is given.

Coal routed all rail is loaded on the cars at the mouth of the mine, shipped over the originating lines to the junctions with the New England roads along the Hudson river: Boston & Maine at Mechanicville or Rotterdam Junction; Boston & Albany at West Albany Transfer; Central Vermont Railway, and Rutland Railroad, via Rouses Point; New York, New Haven & Hartford at Jersey City, or Maybrook Junction; and is carried by these lines either direct to the consumers or to the local dealers who store it for subsequent distribution.

About 70 per cent. of our coal reaches us by tidewater. This is loaded on the cars at the mines and shipped over the coal roads in train-load consignments to the seaboard, the distance varying from 200 to 400 miles. The principal ports of transshipment are Newport News, Norfolk, Philadelphia and Baltimore. At these ports the coal is dumped from the railway piers into the sailing vessels, barges or steamers, and transported to the various ports along the New England coast, where it is delivered direct to such industries or dealers as have discharging plants at tidewater; or else transferred through public discharging plants to cars for reshipment.

To get a good understanding of the coal rate situation, a

study must be made of the maps and tables accompanying this report. There are two maps, one showing the all-rail rates from the mining districts to New England territory, and the other the rates from New England tidewater inland. These maps are compiled from the published tariffs issued by the railways, effective August 1, 1909.

The maps are so compiled that a consumer by comparing the rates with tables of analysis can get, approximately, the relative value of all coals, whether shipped via all-rail or tidewater. He can determine exactly the lowest all-rail rates from any coal field to his plant, and the approximating comparison of the tidewater rates.

In addition to the figures, giving the actual rates, line symbols are used to bring out broad variations in the rates, thus showing the general principles upon which the rates are based. Each line symbol on the map covers a 25-cent range of rates. [On the map from which these illustrations were made, colors are used instead of these line symbols.] Wherever there is a change of rate within the same color group, it is indicated by means of a transverse red line at the point where the change occurs.

This system of symbols brings out clearly the effect of competition on rate-making; not only where two or more roads supply coal to the same district, but also the broader influence that tidewater competition has on the all-rail rates. For instance, the tidewater rates show a rapid rise inland from distributing ports, while the all-rail rates eastward increase with some degree of regularity until they approach tidewater, when they gradually decrease; the result being that the through combination of rail and tidewater rates meets the all-rail rates at points varying from 25 to 50 miles from tidewater.

The chart shows the average monthly vessel rate from Hampton Roads or Philadelphia to Boston. The rates to other New England ports may be approximately determined from the following table:

Salem and Portland	.....	Same as Boston rate
Newburyport	..... 15 to 25 cts. more than	" "
Portsmouth	..... 5 "	" "
Bath	..... 10 "	" "
Gardiner	..... 20 to 30 "	" "
Augusta	..... 25 to 40 "	" "
Belfast	..... 20 "	" "
Bangor	..... 15 "	" "
Bucksport	..... 20 to 25 "	" "
Seaboard	..... 10 "	" "
Calais	..... 25 "	" "
Eastport	..... 25 "	" "
Providence	..... 10 "	less "
Fall River	..... 10 "	" "
New Bedford	..... 10 "	" "
New Haven	..... 5 to 10 "	" "
Norwich	..... 5 to 10 "	" "
Allyn's Point	..... 5 to 10 "	" "
New London	..... 5 to 10 "	" "
Wareham	..... 25 "	more "
Hyannis	..... 25 "	" "
Fairhaven	..... 25 "	" "

The above variations in rate are due, first, to the depth of water at the various ports, which controls the draft of vessels entering; second, to arbitrary towage charges incurred at points where towing is necessary on account of narrow winding channels, tides and currents, and third, to distance.

Since the publication, by the Boston Chamber of Commerce, of the maps, information has been received that the railways, complying with a decision of the Interstate Commerce Commission, have ordered a reduction in rates of 15c. per ton on shipments from the Georges Creek, big vein, and Elk Garden districts when for reshipment by water. The revised rates will then be the same as those applying on Georges Creek, small vein coal, as shown in table on tidewater map.

TRANSPORTATION OF COAL.

During the last decade great advances have been made in the methods of handling coal, both by rail and water, in its passage from the mine to the consumer. Coal roads have been built that run at a very low grade direct from the mines to tidewater, over which unbroken trainloads of from 2,500 to 3,000 tons are run direct to the piers, where expensive plants of the most modern type load the coal into vessels.

Steamers and barges especially built for coal transportation have, to a large extent, replaced the schooners and tramp steamers in the trade to the more important receiving ports; discharging plants at the receiving ports have been greatly improved; the railways are substituting dump cars for the old shovel-out cars; and the more progressive consumers are establishing trestles, conveyors and other mechanical devices so that their coal may be stored and handled on the most economical basis.

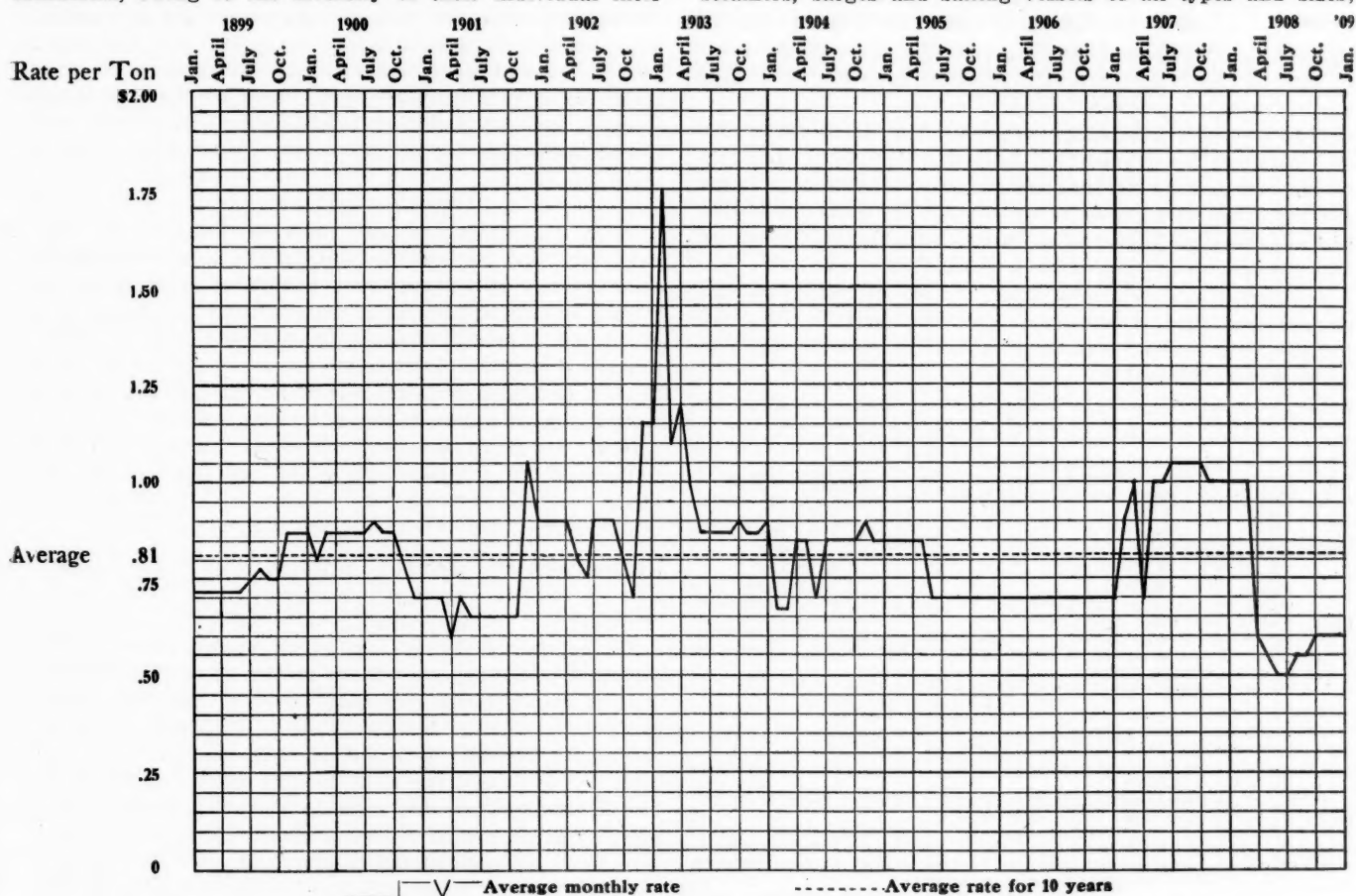
This development, however, has been very uneven: for example, even in New England's largest industrial centers, located on the main lines of transportation, many antiquated appliances and methods for handling coal are still in effect. Such uneven development may be a temporarily necessary accompaniment of any rapid transition such as that which coal transportation is at present undergoing.

As has been shown, the facilities of the producers and the transportation lines are fast becoming modernized; but the consumers, owing to the diversity of their individual inter-

the cheapest method of transportation. On the other hand, a coal steamer, while requiring a large original outlay and large expense to operate and maintain, is capable of much more regular service than the sailing vessel, and is, therefore, best suited for a trade where speed and service on schedule time are needed.

It is becoming more and more essential to have a constant and well regulated supply of coal arriving at our larger receiving ports in order to obtain the greatest economy in operation of railways, discharging plants and vessels. This is due to the large amount of money required for the original investment and for the maintenance of a modern discharging plant, and to the heavy demurrage collected on coal when lying in the harbor waiting to be discharged.

At present the handling of water-borne coal at our larger ports is greatly hampered throughout by the great variety of vessels engaged in the trade. For, first: no loading or discharging plant can be built so as to handle economically steamers, barges and sailing vessels of all types and sizes;



Average Monthly Vessel Rates on Coal, from Hampton Roads and Philadelphia to Boston.

ests, have not as yet concentrated their efforts toward improving their facilities and adopting modern methods, although it is certain that the railways would find it to their own interest to encourage in every way the adoption of improved methods as rapidly as the consumers would do their share; but there is no reason why consumers, transportation lines and producers should not all work together to adopt the best modern methods for handling coal.

WATER-BORNE COAL.

There are many problems in the handling of coal by water which have not yet been thoroughly worked out. The economy in the transportation of coal by sailing vessels comes from the comparatively small original outlay, natural motive power and the cheapness of operation. Consequently, when engaged in a class of traffic where regularity of service is not required, and delays cause little inconvenience, the sailing vessel is

second, as all vessels must wait their turn at each end of their trip, the quickly loaded and discharged modern coal steamers that rely on their speed and regularity of service to obtain economy are often delayed several days by schooners which have been retarded by a storm and have arrived in a fleet with the first favorable wind, and many of which cause further delay, having hatches and holds so constructed as to make them very slow and difficult to unload; and third, no loading or discharging plant, or railway terminal, can be run economically when there is such great irregularity in the supply of business. Consequently, a system should be developed whereby ports with a large demand for coal can be mainly supplied by steamers of a standard type running regularly between plants specially built for loading and discharging them; while the smaller ports capable of receiving light draft vessels only and the irregular trade will continue to be supplied by barges and sailing vessels.

UNLOADING AT DESTINATION.

There seems to be no stage of the handling of coal where the installation of modern methods is more needed than at the unloading plants of the consumers and dealers. The methods in use at present, like all other stages of the handling of coal, are in a state of transition between the old custom of shoveling out all cars by hand and the modern method of unloading by dump cars run on trestles and by grab buckets, conveyors and other appliances. In 1908 about 55 per cent. of the coal delivered along the lines of the three largest New England railways had to be shoveled from the cars at a labor cost of about 15 cents per ton; the other 45 per cent., which was delivered almost entirely to large consumers and local dealers, was unloaded chiefly by trestle dumps.

Owing to this diversity of conditions, the railways find it almost impossible to arrange the distribution of cars to satisfy all. They are called upon to furnish modern plants entirely with modern cars and old-fashioned plants with shovel-out cars. As a result, the consumer installing a trestle has to figure on having from 10 to 35 per cent. of his coal delivered to him in shovel-out cars, and the true economy of modern apparatus is not realized.

This is only a temporary drawback, for as more trestles are installed, fewer shovel-out cars will be used by the railways, inasmuch as the roads find it to their advantage to get the rapid car circulation made possible by quick unloading and are therefore replacing as fast as possible their worn out cars by various types of modern dump cars.

A circular was sent to a large number of steam-coal consumers requesting information as to what facilities they had for handling modern coal cars. The form of and results of which are as follows:

DATA ON CONSUMPTION AND FACILITIES FOR HANDLING COAL OBTAINED BY CIRCULAR SENT TO INDIVIDUAL PLANTS
225 FIRMS REPRESENTING 1,724,075 TONS.

- The distribution of the above tonnage was as follows:

Massachusetts	1,524,695
Maine	105,550
New Hampshire	41,500
Connecticut	38,660
Rhode Island	11,870
Vermont	1,800
- About 25 per cent. of the firms did not know what particular kind of coal they were using.
- Out of 225 firms, 48 state that they have facilities for handling dump cars. The percentage of dump cars supplied by the railways to these 48 firms was as follows:

20 were supplied with practically 100 per cent.
3 " " " between 75 and 90 per cent.
2 " " " 50 and 75 per cent.
2 " " " 25 and 50 per cent.
3 " " " less than 25 per cent.
2 " " " none.
16 did not specify.
- Large coal consumers having no storage facilities, thus requiring daily or weekly deliveries from local dealers.

Number.	Total tonnage.	Average tonnage.
42	86,150	2,050
- Steam coal consuming industries having railway connections, but lacking facilities for handling modern dump cars:

Number.	Total tonnage.	Average tonnage.
26	101,200	3,900

Of these 26 industries, six, consuming annually 46,000 tons, team their coal from dealers to their plants.
- Source of coal purchase by above firms:

Mining district.	Tonnage.
New River ..	598,350 tons.
Pocahontas ..	269,635 "
Georges Creek ..	206,165 "
Cambria County ..	141,905 "
Somerset County ..	127,000 "
Clearfield ..	84,565 "
Canadian ..	68,000 "
Anthracite—buckwheat and bird's-eye...	67,200 "
Broad Top ..	14,515 "
Pittsburgh ..	14,500 "
Westmoreland ..	1,700 "
Tioga ..	1,600 "
Kanawha ..	1,000 "
Not specified ..	127,940 "
Total	1,724,075 tons.

An analysis of statements showing the cost of unloading at individual plants, which were kindly furnished by several large New England manufacturers, shows that there is a saving of from 8 to 12 cents per ton in the operating cost of unloading coal by trestle over the old method of shoveling out cars on sidings. A great advantage is also gained by quick

unloading, assured storage facilities and prompt release of cars. One of these letters is as follows:

June 2, 1909.
Mr. JOHN S. LAWRENCE, Chairman Committee on Fuel Supply,
Boston Merchants' Association, Boston, Mass.
Dear Sir:—In reply to your letter of April 28th, we give below some figures in regard to the cost of unloading coal from drop-bottom, drop-sides and shoveler cars:

Cost of Unloading a 25-Ton Car of Soft Coal.	
Drop-bottom car	\$0.60
Drop-sides car .....	.72
Shoveler car	1.75
Cost of Unloading a Cargo of 1,468 Tons Recently Received.	
13 drop-bottom cars, 25 tons.....	\$9.80
32 drop-sides " 25 "	22.64
21 drop-sides " 17 "	15.12
66	47.56
1,468 tons.....	\$47.56 = \$0.0324 per ton.

This cargo was received on an empty trestle; coal received on a full trestle costs just twice as much, or \$0.0648 per ton, as the coal has to be trimmed back.

In the last few years many small consumers have come to realize that a considerable saving can be made in their fuel bill by erecting a modern unloading plant; and under normal conditions the trestle seems to give the greatest economy and satisfaction. But the cost of installation varies so greatly with the local conditions that it is impossible to estimate the quantity of coal which must be handled annually to make a trestle an economical investment. Most of the New England railways make it a custom to encourage private concerns to install modern unloading plants by furnishing plans and estimates of cost.

BILLS OF LADING.

In the past there has been much complaint on the part of consumers that the coal received has not been that which was ordered, and they have been unable to substantiate their claims because of failure to have in their possession a copy of the bill of lading. Consumers, therefore, should make it a practice to secure bills of lading for every car of coal, as they furnish certification of the exact car shipped in case of dissatisfaction with the quality of the coal received.

In a subsequent issue of the *Railway Age Gazette* that portion of the report referring to the analysis and buying of steam coal will be published.

INCREASES IN MOTIVE POWER EXPENSES DUE TO SEVERE WEATHER.

The severe weather of last winter caused extremely heavy increases in the expenses of the motive power departments of various railways, and especially those in the West. The reports of the Chicago & North Western show that its operating income for January, 1910, was \$818,818 less than for the same month in 1909, and the main reasons given for this decrease in net earnings are increases in operating expenses due to inability to get sufficient fuel at reasonable prices, engine failures and a superabundance of snow and ice. The fuel bill for January alone, it is said, amounted to \$300,000. The published reports regarding the Chicago, Milwaukee & St. Paul show that its operating expenses for the eight months ended February 28, 1910, were \$4,000,000 greater than for the corresponding period of last year, and that of these additional expenses \$345,000 was due to increased cost of locomotive repairs, \$900,000 to increased expenditures for fuel, and \$496,000 to increased wages of enginemen and trainmen.

Another western line, whose motive power expenses were likewise very heavily increased by the severe weather, has made a detailed investigation of all the various conditions which caused the increase. No doubt the conditions which produced these results on the railway in question are similar to those which brought about similar results on other roads, and, therefore, the following very full abstract of a report of its investigation, which related principally to operation during the month of December, 1909, will, no doubt, be of widespread interest to motive power and operating officers:

Just at this time a large number of new engines, equipped with devices which were new to the enginemen were received.

These engines came at a time when the weather was extremely cold, and the power already in service was affected thereby. Under these conditions the efficiency of the engine handlers and attendants became low. The service was also seriously affected by the natural tendency of the older and more experienced enginemen to seek every excuse and subterfuge to lay off in order to escape the extreme weather and the new engines, thus bringing into service a large number of less experienced, also inexperienced enginemen.

The roundhouse facilities at one of the principal terminals were altogether inadequate, due to reconstruction, and the same is true of another roundhouse which was too small. Engines were practically unhoused much of the time during the extreme weather at both points.

The analysis which has been made shows that the greater part of the increase in engine failures during the winter months was caused by trouble with boilers. Seven distinct reasons for the failures stand out clearly, as follows: Cold weather; long time on the road; increase in coal consumption; poor coal; absence of regular crews from engines; inexperienced firemen; receipt of a large number of new engines at times when conditions were adverse. Each one of these items will be discussed more in detail; it seems evident that each of these causes contributed to a greater or less degree to the large increase in engine failures for the months of October, November and December.

The United States weather bureau reported for December, 1909:

"The month was decidedly cold, somewhat moist, with a percentage of sunshine slightly above normal. It was the coldest December on record (twenty-three years), the mean temperature of the division being 8.3 degrees below normal."

The speed of freight trains fell off in December, 1909, about 10 per cent. compared to November, showing that the engines were on the road that much longer, resulting in increased strain on fireboxes and boilers, and this, with the cold weather, would naturally tend to increase boiler failures. The amount of coal burned per 1,000 ton-miles increased very much during the months of October and November, 1909, and in December reached the highest point in three years.

Eastern Division.			
1909.	215 lbs.	Previous High Mark.	258 lbs.
October	215	January, 1909	258
November	235	February, 1908	266
December	270		

This result is, in a measure, due to the severe weather conditions, and indicates that the engines were working harder than ever before, with resulting increased deterioration of fireboxes and flues. There can be no question but what a large per cent. of the coal received during the last three months of the year was of an inferior quality, which no doubt was due to the large demand for better grades of coal for commercial and domestic uses. Furthermore, it was observed that much of the coal delivered to the engines during December had been exposed to rains and freezing, resulting in a large amount of ice being mixed with the coal when received. The result of the inferior coal, and the ice in the coal, was an increase in failures due to engines not steaming.

Each of the large freight engines on the Eastern division had a number of different engineers and firemen during the month, and this condition alone is enough to increase the engine failures to a marked degree. Note particularly engine 521, assigned to the Eastern division with 12 engineers and 20 firemen. This engine had seven failures as follows: 1, air equipment; 1, valve; 1, motion work; 4, leaky flues. Also engine 475 on the Southern division with 16 engineers and 17 firemen. This engine had three failures as follows: 2, not steaming, grates loose; 1, dump grates broken. Engine 482 on the Middle division with 15 engineers and 18 firemen had three failures as follows: 1, broken valve stem; 1, engine lame; 1, engine valves blowing. Engine 670 on the Western division with 12 engineers and 15 firemen had four failures as follows: 1, broken eccentric strap; 1, not steaming; 1, loose

eccentric strap; 1, broken valve and rocker arm. Engine 1028 on the same division with seven engineers and 15 firemen had three failures as follows: 1, broken piston; 1, broken side rod pin; 1, not steaming.

The statistics appearing above would seem to indicate that at least during the month of December the policy of keeping regular crews assigned to engines had not been followed, and this at a time when the rigors of winter demanded that experienced men, familiar with their engines, should be in charge of them.

As stated above, a number of the older enginemen apparently avoided service during December. In such case it would seem that an extra crew should have been assigned to the engine until the regular crew reported for duty, instead of a new crew each trip. As a corollary to the disposition of the older men to avoid service during the rigorous weather and the coming of the new engines, it became necessary to promote a number of firemen and hire new firemen. About 100 new firemen were employed on the Eastern lines alone from October 1 to December 31. So large an increase in the number of inexperienced firemen under such unfavorable weather conditions caused a large number of failures because of sheer inability of the new men to fire the engines.

During the month of December there were received on the line, and placed in service, 27 new engines. These are of the most modern type of locomotive and contain innovations with which roundhouse forces and enginemen were not familiar. These engines were set up and broken in during this period and in consequence contributed a larger proportion of failures than would have resulted from older engines in similar service under the same conditions. Seven of the new engines which were received were assigned to the Eastern division and 24 failures occurred on them during the month of December, 11 of which were front end failures and 10 firebox failures. The evident weakness of the front end of these new engines is being rectified.

The failures for December, 1909, for the entire system increased in all cases over October and November, and reached new "high" records since May, 1907, as follows:

Cause of failure.	Dec., 1909.	Previous high record.
Air equipment	99	October, 1907.... 76
Pistons & packing	76	July, 1907.... 70
Injectors	84	September, 1907.... 68
Foaming	36	January, 1909.... 32
Fireboxes	275	December, 1907.... 110
Front end	80	December, 1907.... 50

The increase in failures due to air equipment may be traced almost wholly to the extremely cold weather. The failures due to hot bearings, valve and valve motion, pistons and packings, injectors and foaming all show increases, but not to the alarming extent of the failures due to leaking and not steaming.

A further subdivision relates to boiler and firebox failures for the system, as well as on the Eastern lines, under the following headings: Leaky flues, leaking firebox, firebox troubles, grate rigging, steam pipe leaking, nozzle leaking, front end rigging misplaced. There is a general increase for October, November and December, 1909, in all cases except front end rigging misplaced. However, there is an increase in leaky flues, and an enormous increase in fire troubles and grate rigging failures. The following tables cover Eastern lines only:

Failures Due to Leaky Flues.			
1909.		Previous high records since June, 1906.	
October	58	September, 1907....	50
November	70	November, 1908....	50
December	70		
Failures Due to Fire Troubles.			
October	20	October, 1906....	19
November	28	November, 1907....	18
December	123	January, 1909....	15
Failures Due to Grate Rigging.			
October	21	August, 1907	21
November	28	November, 1907	20
December	49	February, 1909	19

The following tables for the Eastern lines show that the money spent on repairs to engines has increased about twice

as rapidly as the gross tonnage, which should indicate that the engines were kept in better repair than the year previous:

	Increase over 1908.		
	October, 1909.	November, 1909.	December, 1909.
Repairs to locomotives...	39.7	38.3	45.0
1,000 gross ton-miles...	18.3	21.9	13.9
Locomotive miles	14.0	17.3	17.7

From what has been stated it is obvious that the increase in engine failures was not due to the poor condition of the power, or lack of force to maintain it, but to the severe weather and the unusual and unfavorable conditions attending locomotive operation when the temperature continued very low during several months.

THE NECESSITY OF CARE IN THE INTERPRETATION OF RAILWAY STATISTICS USED COMPARATIVELY.

BY ERNEST RITSON DEWSNUP.

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The growth in importance of the railway has given to its statistics a publicity and a popularity hardly exceeded by those of any other economic undertaking, and of no country is this truer than the United States. Governmental activity has been a stimulating cause of this abundance of information, but the railways themselves have come to realize that it is good policy to be less reserved in their relations with the public than they have been. Thus, a much larger amount of information has been made accessible than government schedules have called for. The facts available, however, have not always been analyzed with due discrimination. Statistical material is highly dangerous to handle, and even those familiar with its treatment have to act with the utmost wariness and discretion. Its way is not so plain that a wayfaring man, though a fool, need not err therein. Defective comparison, arising out of the omission of vital facts, is common. Certain more or less traditional methods of presentation are followed that assume to carry with them illuminating exposition of vital points of railway development and operation, but are more remarkable for what they fail to tell than for anything they do tell. Brevity is the soul of wit in railway statistics as elsewhere, but it can be pushed to the verge of obscurity and, quite frequently, to the point of insufficiency. Another class of defects in statistical comparison arises from a lack of appreciation of the real significance of the data used: the statistician fails to make himself acquainted with the intrinsic worth of his figures. Nothing can be more inimical to the soundness of statistical logic than a hasty acceptance of material used at its superficial value. It is absolutely essential to scrutinize rigidly methods of compilation. Carelessness or oversight in this connection is responsible for many erroneous analyses and vicious comparisons. The following pages contain a brief review of some of the more important railway statistics in the use of which for comparative purposes the writer has observed more or less serious errors. Some of the points touched upon raise issues of considerable dispute, and, if it seems that such are treated too cavalierly, it must be remembered that this is inevitable in a general treatment of restricted length; at a subsequent time it may be possible to discuss these issues more in detail.

FREIGHT HOUSE TONNAGE COSTS.

A good example of the difficulties besetting the path of the statistician without adequate technical knowledge of his facts is to be found in freight house tonnage costs. Freight house operation seems to be very similar, in a general kind of way, wherever it is carried on, and, therefore, fairly capable of being measured as to its efficiency by the actual per ton costs of handling. As a matter of fact, however, while a ton of freight is a uniform unit so far as mere weight goes, it is a very variable one, indeed, with respect to its handling. One consignment of freight may require twice as much handling as another of equal weight. Thus a ton of general merchandise will consume more of the working time of weighers, truckers and stowers than

a ton of iron bars. And a ton of merchandise in twenty different packages will be a longer handling proposition than a ton of similar freight in five packages. Freight houses called upon to handle large quantities of mail-order house shipments usually have this factor of increased cost to contend with, no small amount of such business being in very small packages, consigned to an innumerable variety of addresses. Dissimilarity in the nature of the freight handled manifests itself to the highest degree in the railway terminals of districts with different producing interests, but it may be found in terminals located in the same district, and, to the extent that it exists, renders tonnage costs entirely unreliable as a test of relative efficiency. I have heard of this consideration being ignored even by railway officers in comparing the tonnage costs of freight stations at different points on the lines under their jurisdiction. The officers concerned were perhaps relatives of the newly-appointed division superintendent who, being requested by shippers on his division to provide them with double decker cars, objected on the ground of the expense that would be involved in raising the bridges.

Another element with an important influence upon tonnage cost is the size of the freight business handled. The small freight house seems able to give an appreciable lead to its bigger brother in handling costs, this arising largely from the fact that the bigger freight house required for the business of the latter increases the trucking that has to be done. It ought to be possible, however, to offset much, if not all, of this increase by the introduction of mechanical appliances in the larger houses, but, so far, American freight houses are not remarkable for their achievements in this direction. The more important English terminals, it is interesting to note, have made considerable progress in the utilization of hydraulic and electrical power.

Where delivery of freight is undertaken or arranged for by the railways, local conditions may cause, at some stations, an abnormal amount of rehandling, which, of course, leaves its mark upon the tonnage costs. Variations of cost, arising from such cause, do not exist in this country to the extent that they do, for instance, in England. In very rare instances do railways here undertake the delivery of freight. But it is essential to bear in mind this rehandling element of cost when comparing American with English performances or the costs of various English goods depots. At some important points in England the amount of warehousing, as it is termed, is considerably above the normal, an appreciable portion of the inward freight, instead of being sent out directly by the wagons of the company or of its carting agents, having to be raised by crane to a second, third, or even fourth, story, trucked over a floor often of large area, with the reverse operation to be gone through when the consignee calls for the freight. Sometimes the agent is allowed extra tonnage on this warehousing for the purpose of making costs comparable; thus, for every ton warehoused, a ton and a half, say, would be reckoned in computing the average cost, but this practice is by no means universal.

Tonnage costs as between one terminal and another may be affected by differences in the quality of labor available for freight-house work. Should it happen that the labor environment of two terminals differed very materially, it would be unfair to the local management at the less favorably situated one to accept tonnage costs as indicative of relative efficiency without adjustment being made for this difference. Occasionally very special labor conditions introduce a still further disturbing element. I cannot think of a better illustration than the casual labor so effectively made use of at several of the London goods depots. Where labor of this kind can be procured but a minimum full-time or regular working force needs to be maintained, the casual labor, waiting around the office for a job, being brought in for the busy period at a comparatively low rate of wage per hour. Ordinarily, such labor would be regarded as unreliable and inefficient for the

class of work to be done, but in London this does not seem to be the case. In fact, a considerable number of these men become more or less regular "half-timers," and vacancies in the full-time force are filled from their ranks quite frequently. Strange as it may appear it sometimes happens that such promotion is refused, the chosen ones preferring the comparatively go-as-you-please conditions of casual employment to the more rigid requirements of regular work. The result of such labor arrangements is to enable the terminals thus advantageously situated to keep their tonnage costs far below what they would normally be.

Freight-house costs, it is hardly necessary to observe, may be "in" or "out;" that is to say, the costs of working inbound or outbound freight. The two are essentially distinct. Under normal conditions, the cost of working inbound freight should run lower than that of outbound, since the former freight can be unloaded with greater dispatch and less irregularly than is the case with the corresponding operations of loading.

Tonnage costs are commonly relied upon as a fair basis for the comparison of efficiency in the same freight-house from period to period, and, as a rule, justifiably so. But, even in this case, the value of the comparison depends upon the absence of change in the general nature of the tonnage handled as well as on other conditions. But traffic conditions alone being taken into account, it is quite possible that a change in these might increase tonnage costs, say, from 35c. to 37c. a ton, in spite of a real improvement in the working efficiency of the house during the period of comparison.

From what has been said it appears very evident that as a comparative measure of relative efficiency of management the tonnage cost of handling may prove to be a very misleading guide, especially when applied to different terminals, but, at times, even when applied to the same terminal.

YARD CAR COSTS.

Yard car costs also require considerable care in their use. As a test of relative skill of management, they fail because of the differences in labor quality, in nature of work to be done, in the physical condition of the yard, in climatic and other conditions. But they may be, and frequently are, rendered entirely useless for statistical purposes because of the lack of a uniform system in compiling them. Thus, some terminals base their yard costs per car upon the number of cars received and forwarded in trains and received from and delivered to connecting lines. In other cases, not only these car movements are included, but also many of the internal movements, such as cars to and from transfer tracks, cars to and from team tracks, and so on. This difficulty as to what properly constitutes a car movement could be overcome by agreement, but at the present time it still presents a serious obstacle to the successful comparison of yard costs as they are actually furnished by different terminals. In every case, it is necessary to go behind the figures given and to analyze their method of compilation.

PASSENGER AND TON-MILEAGE COSTS.

Passenger and ton-mileage costs have been made much use of by practical men and by theorists, but, frequently, with a careless disregard of the limits of their usefulness. More than one writer has been content to assume the propriety of measuring the general operating efficiency of one railway system against that of another by means of the costs of operation per passenger or per ton per mile. Such a comparison is too unreliable to be depended upon as a guide to relative efficiency. It takes for granted that labor, physical, traffic and other conditions are fairly similar, though, in fact, they are frequently extremely dissimilar. To say that one road operates its freight traffic at eight-tenths of a cent per ton-mile and another road at six-tenths of a cent is to throw absolutely no light upon the skill with which the freight traffic of the respective roads is worked. The road with the higher ton-mile cost may be the one most efficiently operated. The only real value of such traffic mileage costs is in keep-

ing track of the movement of operating costs on the same railway, or, preferably, on the individual divisions comprising a railway. I say preferably, as regards the latter, because the general average for the railway as a whole may have remained unchanged over the period of investigation and yet the real operating conditions may have materially altered, progression on some divisions being counterbalanced by retrogression on other divisions. Even within the limits of a single railway it may be decidedly unfair to measure the operating results of one division against those of another—conditions must be substantially similar before cost results can be accepted as the basis of such a comparison.

The value of ton-mile costs has been emphasized by some because of a belief that they afford a scientific basis for the establishment of reasonable rates. Yet, it is not possible to allocate, other than by arbitrary pro-rates, more than, at the most, about 75 per cent. of even the transportation and maintenance costs to the respective freight and passenger services. And since, as a matter of practical necessity, a railway must pay interest on funded debt, interest on current liabilities, rents for leased lines, taxes, and, for future protection, permanent improvement expenditures charged to income, there still remains nearly 30 per cent. of the total expenditures, essential to the working of the system, which again can be allocated only on a more or less arbitrary pro-rating basis. Thus, close upon half of the annual costs of maintaining a railway organization and securing its operation are, in the present state of our knowledge of railway costs, incapable of being accurately divided. The actual cost might vary materially from the pro-rated cost, and, to the extent of this variation, the reliability of the latter as a criterion would be impaired.

But even if it were practicable to allocate to the freight service as a whole its proper proportion of costs, it would still be a far cry to the distribution of these costs between the multitude of commodities transported by the railway under very varying conditions of speed, equipment facilities, terminal handling and so forth. There are some happily-dispositioned writers and regulative bodies who see all these difficulties vanishing into thin air when resort is had to some magical pro-rating basis as train mileage or gross ton-mileage, or the like. These engineers of philosophy are so much in advance of many of us poor mortals that they have no trouble in determining the roadway maintenance expense due to a 50-mile an hour 500-ton through express passenger train as compared with that due to a 12-mile an hour 2,500-ton freight train, stopping, maybe, at almost every siding. Their attitude is picturesque, but unconvincing.

It should be said further that if an allocation of costs to each unit of freight could be satisfactorily made, the problem of reasonableness would still remain unsettled. The theory of reasonable rate determination with reference to traffic mileage costs means, I take it, the fixing of a rate at a figure allowing a reasonable rate of profit above cost of operation; but, as a practical proposition, how is the latter to be determined? It should certainly be reasonably related to the risks and difficulties of the business, but who is to fix the specific nature of that relation? Are the risks of railway business equal to, less than, or greater than, those of banking, insurance, steel manufacture? If not identical, what percentage of variation in profits will represent the variation in risk? Again, absolutely uniform efficiency of management cannot be expected, and uniformity of working environment is, of course, impossible. Hence, one series of railway operations under control of railway company X will be handled much more economically than a corresponding series controlled by railway company Y, resulting in a lower cost per unit of traffic. Is X to be allowed to charge rates similar to Y, and, if so, is the extra large profit it secures as a result of its greater efficiency a reasonable rate of profit? On the other hand, if its rates are adjusted so as to reduce its

rate of profit to the same level as that of Y, will there not result territorial rate discrimination quite as clear-cut as anything that occurs under the present commercial system of rate making?

TRAIN AND ENGINE-MILE AVERAGES.

Other interesting operating statistics are train and engine-mile averages, which, in their general form, have less utility than some would ascribe to them. A passenger train-mile covers everything from the more or less dilapidated crawling local on branch lines to 60 miles an hour luxuriously appointed expresses on the main line, from a train of an engine and one car to one with a dozen or more cars. Similarly, the freight train mile coerces into statistical uniformity the humblest way freight with, perhaps, a total weight of a couple of hundred tons behind the tender to the 100-car, 3,000-ton train; it connects the slow "dead" freight train with the high-speed "manifest" train: coal train, live stock, merchandise train—all are indiscriminately mingled in the average. An arithmetical average is obtained, it is true, but one of treacherous utility, unless environed by a galaxy of interpreting, modifying and saving clauses, only to be used by the initiated, and even then with the greatest circumspection.

It is still customary, on the part of some transportation students, to depend upon engine mileage as a reliable basis upon which to establish comparative efficiency statistics of an important brand of railway operation. The value of such statistics depends very largely upon the way in which they are put together. But general averages of engine-mile costs can hardly be regarded, under any conditions, as affording the means of drawing conclusions of any practical worth. The engine-mile, in its general form, is itself variable. Its elements may be freight or passenger or switching engine, high-speed Atlantic or low-speed consolidations, with tractive powers of infinite variety. Obviously, when such engine mileage is used as a measure of costs, it fails lamentably to serve any useful purpose. To do this it must be limited to engines of the same general class, and even then its definiteness is not altogether satisfactory. Clearly, a compound unit of performance which allows for the influences of physical conditions, such as gradient and curvature, and also for speed, is the only sort of unit really suitable even in a restricted analysis of engine mileage costs. Uniform units of work done need to be established and engine costs related to these; this the engine-mile average fails to do.

FREIGHT CAR TON MILEAGE.

Freight car efficiency is a matter of great railway interest and its proper measurement seems to be logically based upon the performance of the average car in loaded car miles. The calculation of this would ordinarily be a very simple process, namely, the division of the total ton mileage by the number of cars employed. Unfortunately for the student of railway reports, it is not obtainable so easily as one would suppose from the foregoing. In the first place, the freight cars reported as owned, both in the statistics furnished in the annual reports of the Interstate Commerce Commission and in very many railway reports, are those owned on the last day of the fiscal year. It is obvious that the loaded car miles are made by the actual cars in operation, some of which have been in service throughout the year, others for less periods varying from several months to but a few days. Evidently, the equivalent number of cars owned throughout the year is required as the divisor, otherwise the quotient will be more or less inaccurate as a test of efficiency. In the second place, the ton mileage reported is the result of work done both by home and foreign cars. Cases have been known in which the cars upon the lines of a railway have exceeded by as much as one hundred per cent. the number owned by it. Under such conditions, even if the equivalent number of cars owned throughout the year were available, the quotient of total ton mileage divided by the same would be very far from representing the

exact work of the cars. Of course, in dealing with statistics of the United States as a whole, this possible source of error disappears except in so far as car relations with Canada and Mexico affect the situation, and any disturbance of results from such would be so small as to be negligible. In the third place, reported ton mileage is made up of tonnage hauled by the railway both in its own cars and in privately owned cars. Here again it is apparent that the car ton mileage obtained in the usual fashion is in error. The private cars working the ton mileage need to be included, or better, for purposes of the comparison of efficiency of the freight car operation of different roads, the ton mileage of private cars excluded. The latter is preferable because of the special conditions surrounding certain classes of private car movement, ensuring frequently a superior performance to that of the railway owned car, and, further, because of the differences, as between railways, in the extent of this private car traffic.

But supposing that all these difficulties in the determination of freight car performance are satisfactorily met, the greatest caution is still required in interpreting the results. It is quite conceivable that a lower ton mileage average may represent as great or greater operating efficiency on the part of the railway concerned as the higher one of another road. This arises out of the varying influence on mileage of different species of traffic. The larger the proportion of local freight traffic, the lower will tend to be the mileage made, but the reduced ton mileage average by no means infers less efficiency. Again, the existence of an unusually large percentage of colliery traffic will ordinarily exercise a depressive influence upon the ton mileage, on account of mine delays and unloading time allowances. Demurrage regulations are also a factor not to be overlooked in deducing results from ton mileage performances of railways situated in different territories. If the legal loading or unloading free time is 48 hours in the territory of one road and 96 hours in the territory of another, mileage movement in the latter case is restricted. The restriction is not effective to the extent of the difference in legal time, it may be noted, since there would be in both territories a large number of shippers who would not make use of the legal maximum.

THE OPERATING RATIO.

The operating ratio is generally accepted as a statistic of great value. Yet in the usual form of the percentage of total annual operating expenditure to total annual operating revenue, its value is liable to exaggeration. The same operating ratio may conceal any number of changes in efficiency of performance from year to year. Thus, in a certain year, extravagant operation during the season of light traffic may be counterbalanced by an abnormal increase of business during the period of heavy traffic, with the result that the operating ratio stands at the same level as, or even lower than, in the previous year when, say, greater uniform efficiency of operation was obtained throughout the year. The general operating ratio may frequently fail to indicate movements in maintenance of roadway, maintenance of equipment, traffic, conducting transportation, and general administration, in which considerable variations may occur and yet leave no record in the general ratio. The mere statement that the operating ratio is this and that in years of comparison is meaningless from the point of view of operating efficiency until most careful scrutiny is made of its component factors. An increase in it may cover greater efficiency, a decrease relatively greater inefficiency, and a stationary position either one or the other.

Error can easily be made in comparing operating ratios of different systems by reason of opposed financial policies in the roads compared. For example, the ratios are not comparable in the case of two systems, one of which charges as much of permanent improvement expenditure as possible to repairs account and the other as little as possible.

PASSENGER ACCIDENT AVERAGES.

Passenger train accident figures are of all railway statistics.

the ones which are most profusely presented to and most eagerly devoured by the public. It goes without saying that the presentation of numbers of killed and injured without reference either to the conditions out of which the accidents arose or to the relation of these numbers to the traffic is a very partial and defective, therefore improper, method of comparing safety in travel on different systems. Nor are such averages as number killed and number injured per so many passenger journeys of appreciable value in endeavoring to measure the relative frequency of accident.

It is necessary, in the first place, to segregate accidents arising out of passenger train movement and beyond the control of the passenger, from the rest, and, in the second place, to average these accidents upon the passenger train mileage, so many accidents per one million train miles, and, associated with this average, should be the average number killed and average number injured per one million train miles. The latter figures emphasize the waste of human life and efficiency, but to my mind the former averages are the more valuable. The number killed and injured in a collision or derailment is almost a pure matter of chance, influenced by car structure, by presence of inflammable oils, live coals, etc., by distribution of passengers in the cars, and by other circumstances. An accident that, by all theory, ought to have caused the most serious disaster may be trifling in its effect; an accident that normally would have produced a few injuries may, unexpectedly, result in lamentable loss of life. So that really, relative efficiency, in the matter of avoiding accidents in passenger traffic, would be shown best, not by reference to persons killed and injured, but by the number of train accidents per million passenger train miles, and such figures would form a desirable addition to every report of railway accidents. Railways have a natural aversion to display their weaknesses in the form of train accidents, but it would exert a beneficial influence upon them if they were required half year by half year to publish in the leading daily papers a full statement on oath showing the relationship of their accident roll during the period to the amount of traffic they handle. At the same time it would be unfair to the railways to pass on without saying that several roads have been and are devoting great attention to the removal of the causes of accidents. Surprise checking, public investigations, and so on, are some of the methods that promise satisfactorily.

MILEAGE STATISTICS.

Little need be said here about mileage statistics. It is obviously inaccurate to compare the extent of railway systems by route, or geographical, miles. Such a comparison ignores the capacities of the systems compared, as represented by additional tracks and varying yard facilities. It is like comparing two factories on the basis of the number of machines employed, without reference to the capacity of the same. Of late years this has been rectified in some private and official statistics by showing, in addition to route mileage, single track mileage, and, in some cases, mileage of yards and sidings. Even when this information is given, further analysis is required if one is to gain a useful idea as to the real meaning of the mileage to the community. When comparing the mileage of railways or railway systems, the student needs always to ask himself the question as to the extent to which effective distribution of mileage has been attained, and effectiveness in this case should refer to the general economic interests of the country, for, after all, such interests in the long run underlie private progress and success. The distribution of the mileage is an important consideration, since, in two regions of equal area and equal railway mileage, the mileage may be well spread in one and very badly spread in the other. It is to the ultimate economic interests of any state or country that its railway mileage should be located so as to give reasonable, though not necessarily uniformly equal, accessibility to all districts. Over-concentration of mileage in one part, a not un-

common phenomenon, is frequently accompanied by lack of facilities in other parts. Again, an area intermediate between two other areas may have a fairly considerable railway mileage much more calculated to serve the interests of the other areas than those of its own. Mileage per unit of area or per unit of population is a useful figure, but incomplete. Equality in these respects may hide very real differences of utility and an area with an inferior showing may really be better served.

TRAFFIC MEASUREMENT.

Limits of space forbid much attention in this article to the statistics of traffic measurement, though the subject is one worthy of detailed discussion. It is generally understood that, for purposes of comparison of freight business, ton-mileage is a more adequate basis than actual tonnage. Yet even ton-mileage is unsatisfactory; its general nature necessarily deprives it of efficiency as a measure where conditions are different, as is commonly the case. The tonnage movement measured may be largely one of minerals "foreign received" and "foreign delivered," or it may be largely one of merchandise locally collected and distributed. In amount of work involved, in value of service to the railway, the traffic of one road would be poles apart from that of the other, but no indication whatever of these differences would find expression in the general ton-mileage figures. In every case of summarized statistical presentation of freight traffic conditions it should be made an invariable rule to show grouped commodity ton-mileage; in most instances the requirements of general comparison would be met by a classification into forest products, mine products, agricultural products, manufactures, merchandise and miscellaneous. From statistics of this kind one is able to form a fairly intelligible idea of the traffic of roads compared and their relative importance in this respect, which is more than can be said of the lumped ton-mileage figures. A further division might be made into *local*, *through-originating*, *through-terminal* and *through-transfer*, understanding by these terms the ton-mileage of freight forwarded from and delivered to stations on company's system (*local*), forwarded from local stations to "foreign" points (*through-originating*), received at local stations from "foreign" points (*through-terminal*), and received from "foreign" stations for delivery to "foreign" stations (*through-transfer*). This would complicate somewhat any general tabulation of statistics, but not seriously, when the information deducible from the addition is taken into account. Briefness of exposition and economy of space are idle virtues if they are secured at the expense of intelligibility.

CAPITALIZATION STATISTICS.

Capitalization per mile is a statistic which incompetent hands are capable of badly mis-using. Intrinsically the figure is worthless, for comparison useless, unless qualified by a whole host of explanatory clauses. Yet it is frequently used in comparing costs of different systems. The practice is faulty because (1) the comparison is made on geographical mileage whereas the expenditure has been made on track mileage, (2) the manipulation of capital in the form of nominal additions has varied considerably from system to system so that the ratios of real costs are very different from those of nominal costs, (3) the existing extent of capital has been influenced to no small degree by differences in policy as to the handling of betterment expenditures. In any case, since conditions of legal procedure, land acquisition, labor supply and so forth, vary most widely in railway building, it is hard to see how much wiser one is for knowing that Railway X cost \$70,000 a mile and Railway Y \$250,000, even when adjustment has been made for artificial differences in capitalization. Certainly, without a very detailed knowledge of the underlying conditions, it would be hazardous to assert that the former road was economically built and the latter extravagantly. The costliness of a machine is relative to the

work it does, and hence, of the two, the \$70,000 road may happen to be the extravagantly built one.

Capitalization statistics evidence great variations in capital per mile of line, and this fact, correlated, as it has been, with spectacular feats of financial legerdemain on the part of certain railways, has wrought a conviction in the minds of many that overcapitalization is a common condition of American railways, influencing unfavorably the level of rates. Now it is unquestionable that considerable nominal additions have been made to railway capital, but against such increases need be set off the also considerable portions of revenue that have been expended in permanent improvement, as well as those decreases in capital that have occasionally occurred in transfer of ownership. It is impossible to determine the relative size of these items, and he is a man of easy conviction who is prepared to argue that, for the railways of the United States as a whole, the former is materially greater than the latter. And if it is, the difference must be very much less than most people credit. The previous statement infers that the proper measure of railway capitalization is actual original investment in the property plus the cost of improvements whether paid for out of capital or out of revenue. If railway building were to be started all over again, the restriction of capitalization within these limits would be justifiable, theoretically, at any rate. It is to the interest of the investing public, and of the community at large, that the real profit capacity of every railway property should be apparent on the face of its balance sheet and income account; only when capitalization is identical with actual investment, is it practicable to keep track of the real profitability of the undertaking. It would surely seem that actual investment in the building and improvement of a railway is the logical basis of capitalization, though it may be a very untenable one from the standpoint of business men and their traditional methods. But, comes the objection, is it not proper, even theoretically, to allow X or Y to increase the capitalization of a railway he purchases up to the limit of the price actually paid? Does not this price represent to him a real investment? Plausible though this seems, I can hardly admit that it is theoretically justifiable. What X or Y pays to secure the profits to which each certificate of the capitalization entitles him represents his valuation of the property; thereby he decides with what rate of profit he will be satisfied. The money he pays goes, not into the railway, but into the pocket of its former owners. There is no valid reason why his valuation and what he purchases, namely, the investment of a million dollars, or whatever it may be, in the production of a certain utility, should be equalized. In fact, logically they cannot be. The investment for the purpose of producing the utility, and it is immaterial whether some part of this investment was judiciously made or not, is one thing, and his investment for the purpose of securing the profits arising out of that utility is another. As a matter of fact, the purposes underlying increase of capitalization, following acquisition of a property, are frequently those relating to speculative trading or to the concealment of rate of profit. This does not deny the justification, either at the time of a purchase, or at any other time, of an increase in capitalization equal to those permanent improvement expenditures out of the revenue of the property not previously taken into capital account, or, of course, of an increase in capitalization for the purpose of securing funds which are intended to be, and actually are, sunk in the business. I fully realize that the application of the theory now stated would have retarded the promotion and construction of certain railways, but the history of railway enterprise in this country, especially for the couple of decades or so following the Civil War, leads one to believe that this retardation might have had advantages of its own, and that there would have been less economic loss from foolish location and unduly speculative building.

A business undertaking is sometimes capitalized at an amount over and above that necessary to carry on the business, only a part of the amount called for by each share being actually subscribed, this arrangement having advantages in enabling further capital (within the limit of the share liability) to be obtained with certainty, promptness, and frequently with economy. In such cases, the real capital is the subscribed capital, and the law should require every official statement of capitalization of such a company, and every stock exchange quotation, to be accompanied by figures showing the subscribed value of each stock certificate.

Sufficient has been said to indicate the rashness of a sweeping charge of overcapitalization, since it is clear that the only real and satisfactory test of capitalization cannot be applied. This difficulty has induced financial writers to suggest the application of cost of reproduction or of market valuation of securities as suitable criteria. The latter is but a function of income-earning power, representing an averaging down of profits, and bears no relation to the investment. Capitalization on this basis serves but to hide the real profitability of the investment. And, anyhow, the market prices of securities bought and sold on the exchange form an unreliable guide, because these are the prices usually of but limited amounts, and it by no means follows that an offering of the whole issue at one time would secure similar prices. Cost of reduplication is obtaining more favor than market valuation, but, obviously, as costs and conditions of construction are constantly changing, the cost of reduplication may be far removed from the actual costs, and hence this falls as an accurate criterion. Yet in the case of the majority of American railways, a physical valuation of the existing property would probably represent a reasonably fair maximum capitalization, and capitalization much in excess of this, though not necessarily fictitious, must be looked upon with suspicion. If physical valuation is to be accepted as a satisfactory test of capitalization, the charge of general overcapitalization must forthwith disappear, as it may safely be said to be impossible to reproduce the railways of the United States for the amount per mile represented by their capitalization.

The effect of overcapitalization upon rates falls too much outside the scope of this article to justify more than a brief reference. It is difficult to imagine that, under the competitive conditions so characteristic of a large part of the railway business of the United States, degree of capitalization can definitely influence transportation rates. The capital invested in railways is largely sunk once and for all. Track, locomotives, cars and appliances will deteriorate, even if not used. Hence, any rate that returns, in the estimation of the railway manager, somewhat more than sufficient to defray wear and tear due to the traffic and cost of transportation will be better than no traffic. This is, under ordinary conditions, the nether limit of rates, a limit to which they rarely descend, but the existence of which, nevertheless, is powerful in influencing the actual level at which they settle. Such favorable conditions for the exercise of competition prevent the railway manager from basing his rates upon the capitalization. Thus it happens that, in the case of a group of important western roads, the one with more than three times the capitalization of any of its rivals is forced, by the exigencies of competition, to give even lower rates than the others. Where a condition of monopoly exists, it is possible that overcapitalization may have a general effect upon rates, if the rates, before the excess of capital is superimposed, are such that an appreciable increase in them would neither lessen present traffic nor prevent the development of future traffic to any appreciable extent. If the railway, under such monopolistic conditions, is already exacting the return which gives it the maximum net profit, then an increase in rates would be inconceivable, as it would slow down the traffic and represent a voluntary reduction of profit to a point below the

maximum. The conditions under which cases of capitalization tend to affect the general level of rates are much more likely to occur in local than in through traffic, but even local rates fail to show many instances of increase that can be definitely ascribed to manipulation of capitalization.

The foregoing survey of some of the more important railway statistics has been by no means exhaustive, but enough has been said, it is hoped, to emphasize the limitation attaching to them, especially as usually presented, and the necessity of a careful and intelligent interpretation. Neither railway officials nor writers employing such statistics have always exercised good judgment in this respect. Too frequently may they be found resorting to reasoning which suggests, as a well-known statistician remarked some years ago, "a man trying to lift himself over a fence by his boot straps." It is, indeed, extremely easy in statistical elaboration to pass from one assumption to another until out of a mass of figures certain results are obtained which are accepted as precise and accurate without recognition of their hypothetical basis. Only by extreme vigilance can errors of this kind be avoided. In so far as the previous discussion may act as a reminder of this "prone to error" in statistical reasoning, it will have served its purpose.

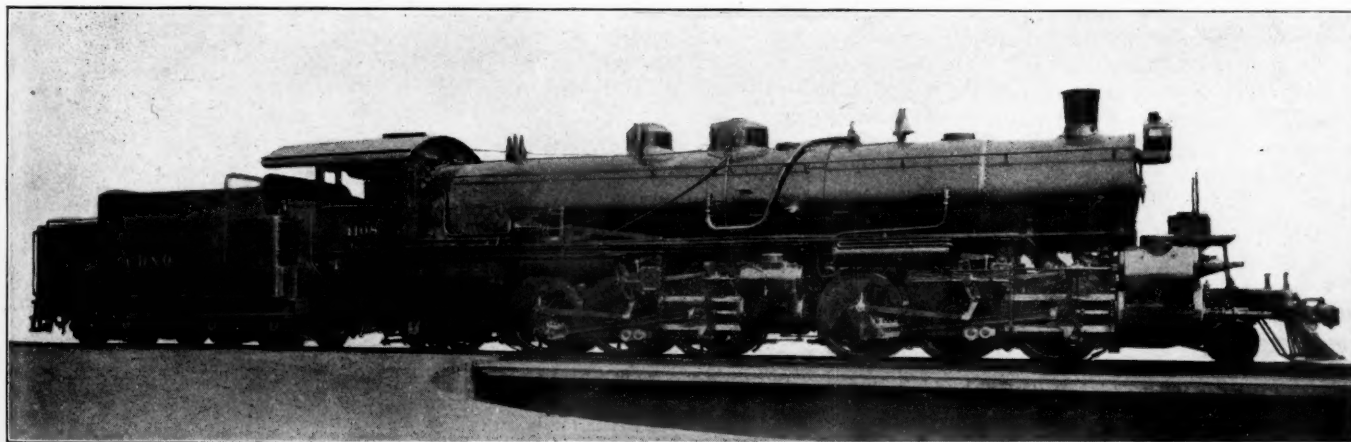
MALLET LOCOMOTIVE FOR THE BURLINGTON.

Mallet locomotives are being developed with such rapidity and in such a variety of forms as to overshadow those of the older designs. The great length of boiler shell, necessitated

proper is composed of three rings, and these have butt jointed seams on the top center line, with diamond welt strips inside. The dome is placed on the middle ring. A combustion chamber is located in the forward end of the boiler proper, and this chamber is surrounded by a separable joint designed in accordance with the well known practice of the builders.

The superheater, which is of the Emerson type, is placed in the combustion chamber, and the dry pipe communicates directly with its headers. There are two of these and they are set vertically on either side of the combustion chamber. The heating surface of the boiler tubes amounts to 2,708 sq. ft. and is made up of 28 tubes 5 in. in diameter, in which the superheater pipes are placed, and 218 of 2¼ in. diameter. Each header consists of a steel casting in which two cavities are cored as shown in the section. One of these cavities, A, the one placed at the front, extends from the connection with the dry-pipe to the bottom where it is blanked. The other, B, runs from the bottom, where it connects with the steam passage in the saddle to the high-pressure cylinder, to the top where it is blanked. Opposite the header are the large tubes in the boiler in which the superheater pipes are placed. They are set in two vertical rows, seven in each row, 13½ in. between the centers of the rows, as shown on the cross section of the shell. These tubes are set opposite each other in the two rows, and not staggered so that there is a clear space of 8 in. between them. This is occupied by three rows of 2¼ in. tubes set and staggered in the usual manner.

On each side of the header there are two connections for the superheater pipes, one to the front section, A, for the



Mallet Locomotive; Chicago, Burlington & Quincy.

by the peculiar construction and arrangement of the running gear, lends itself readily to the introduction of fuel-saving devices that cannot be economically applied to the ordinary locomotive, such as reheaters and feed-water heaters.

A description of a Mallet locomotive with a reheater and a feed-water heater, built for the Atchison, Topeka & Santa Fe, was published in the *Railway Age Gazette*, of November 26, 1909. This same combination, but with a different arrangement of parts has been recently applied to ten locomotives of the 2-6-6-2 type, built for the Chicago, Burlington & Quincy by the Baldwin Locomotive Works. As the road already has eight engines of the same type in service without the superheaters and feed-water heaters, an opportunity is now afforded to compare the two in regular work. The new locomotives will be used in freight service on maximum grades of 1.6 per cent. They are designed to traverse 20-deg. curves and are equipped to burn liquefied. The boiler is of the separable type with the superheater in the rear section. It is straight topped with a radially stayed wide firebox. The side water legs incline slightly inward as they rise, and both the throat and back head are sloped. The barrel of the boiler

saturated steam and the other to the rear section, B, for the delivery of the superheated steam. The superheating is accomplished by passing the steam through a coil of four pipes, arranged as in the Cole superheater, but with a difference in the details of the fittings. The tubes themselves are 1½ in. outside diameter and of No. 9 wire gage. They are expanded into the header openings at 1, 1, of the cross section and the opening beyond is closed with a 1¼-in. plug. The fittings at the rear end of the tubes are steel castings in the form of a flattened return bend, with the upper one set 8 in. ahead of the lower. One is a simple bend, but the other has lugs cast upon it, on which it rests on the lower pipes. This holds the nest together and prevents a racking of the connections which might otherwise occur. The pipes are clamped together outside the boiler as shown, so that the nest is practically brought together as in a single piece. The course of the steam, then, is from the dry-pipe into the front cavity of the header, thence back and forth through the four superheater tubes to the rear cavity of the header, from which it goes to the high-pressure cylinder.

The combustion chamber, in which the superheater headers

are placed, is almost wholly in the rear section of the boiler. From the front tubesheet to the joint is 60% in. and from the joint to the face of the feedwater heater tubesheet it is 8 in., thus making the total length of the combustion chamber 5 ft. 8% in.

The front section of the boiler contains the feed-water heater, the reheater and the smokebox. The feedwater heater is of the same type as that used on the Atchison, Topeka & Santa Fe locomotive already referred to. That is to say, it consists of a nest of firetubes set in two tube sheets and surrounded by water. In this case the tubes are longer and have a greater heating surface than in the Santa Fe locomotive. In the latter they were 76 in. long and contain 1,279 sq. ft. of heating surface. In the Chicago, Burlington & Quincy locomotives they are 8 ft. 11 in. long, 2% in. in diameter, 406 in number and have 2,172 sq. ft. of heating surface. The tubes do not, however, occupy the whole section of the boiler. On the center line there is a flue 17 in. in diameter, in which the pipes for the reheater are placed.

The reheater consists of a nest of 19 tubes 2 in. in diameter, rolled and beaded into headers at each end. These headers are steel castings, fitted with ball joints at their outer extremities, that serve as connecting points with the intermediate steam or receiver pipes. The reheater flue is 9 ft. 8 in. long over its flanges and the distance between the reheater headers is 10 ft. 8% in., so that they stand off 6% in. from the flue at each end. This 6% in. gives the requisite space for the gases to turn and be drawn into the flue from the combustion chamber. The headers are carried by cast iron pipes rising from the bottom of the shell. At the rear the connection is made from the exhaust passage in the high pressure saddle, and at the front to the ball-joint elbow of the flexible intermediate steam pipe, the flange of which is rivetted to the bottom of the shell.

From this point on the arrangement of piping to the low-pressure cylinders and for the exhaust from it is the same as that used as a standard by the Baldwin Locomotive Works and illustrated in connection with the description of the Mallet locomotive built by them for the Atchison, Topeka & Santa Fe.

As in the case of the Atchison, Topeka & Santa Fe locomotive the injectors deliver directly into the feed-water heater, which is kept full of water at all times. The check is set 24 in. back from the front end, and the water that is crowded out leaves at the top and comes down the sides through the bent pipe, as shown, to the regular boiler check.

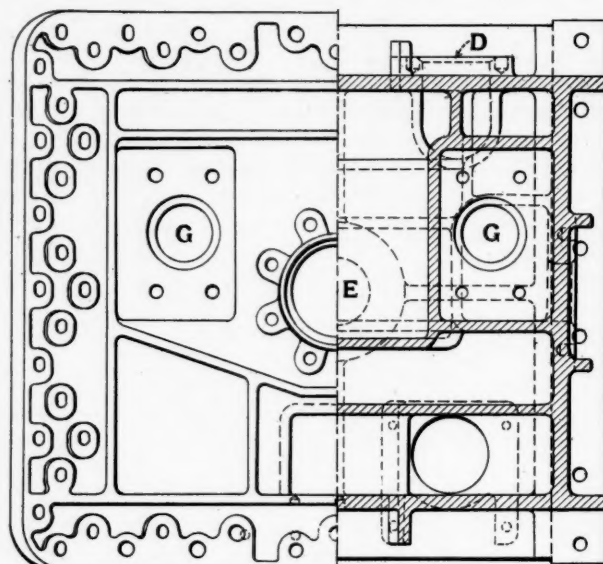
There is one link in the steam passage system from the dome to the smokebox that deserves attention. It is in the saddle for the high-pressure cylinders. It will be remembered that the superheated steam is delivered at the bottom of the headers on each side. These discharge into the openings, G G, in the top of the saddle. From here there is an elbow passage leading to the side at C C, where a direct connection is made to the cylinder. The exhaust, however, takes a somewhat roundabout course. It leaves the cylinder at the rear and passes through a return bend pipe, shown at H on the outline elevation of the engine, and delivers into the saddle at the point D on its rear face, there being one of these connections on each side. From here there is a cored passage to the central outlet, E, where the intermediate or receiver pipe is seated. The bottom of the saddle carries the usual bracket for the pin connection of the front frame.

The frames are of cast steel 5 in. wide, with a single hinge connection. The frames of the rear engine have separate back sections, also of cast steel. The pedestal binders are of the same material and are lugged and bolted to the pedestals. The front truck is equalized with the leading driving wheels through an inverted leaf spring suspended from yokes placed over the forward driving boxes. The back end of the equalizer rests on the middle of this spring. The rear truck is of the "Hodges" pattern with outside journals. The side swing is

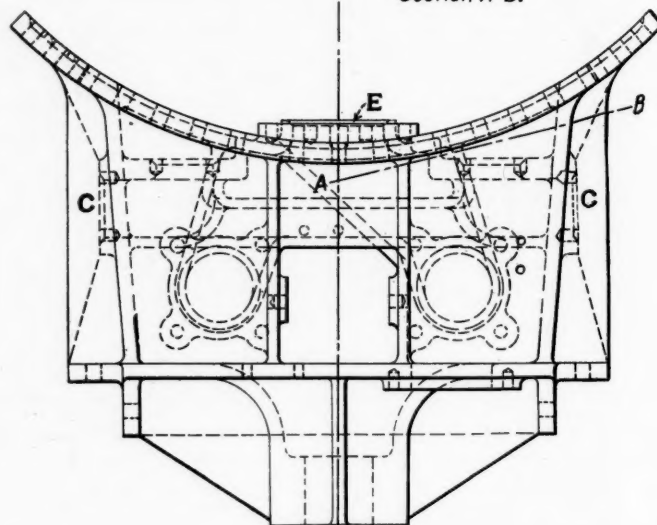
taken by the spring hangers which are jointed for the purpose.

The boiler is supported on the front frames by two waist bearers, both of which are normally under load. The front bearer carries the controlling spring and acts as a support for the low pressure guide bearers. The high pressure guide bearers are bolted to a specially designed steel casting, which also serves as a support for the link bearings. Two waist sheets support the boiler barrel over the rear frames and the mud ring is carried by sliding shoes in front and a buckle plate at the rear.

Reversing is effected by the Baldwin power gear and the two reverse shafts are connected by a single reach rod placed



Section A-B.

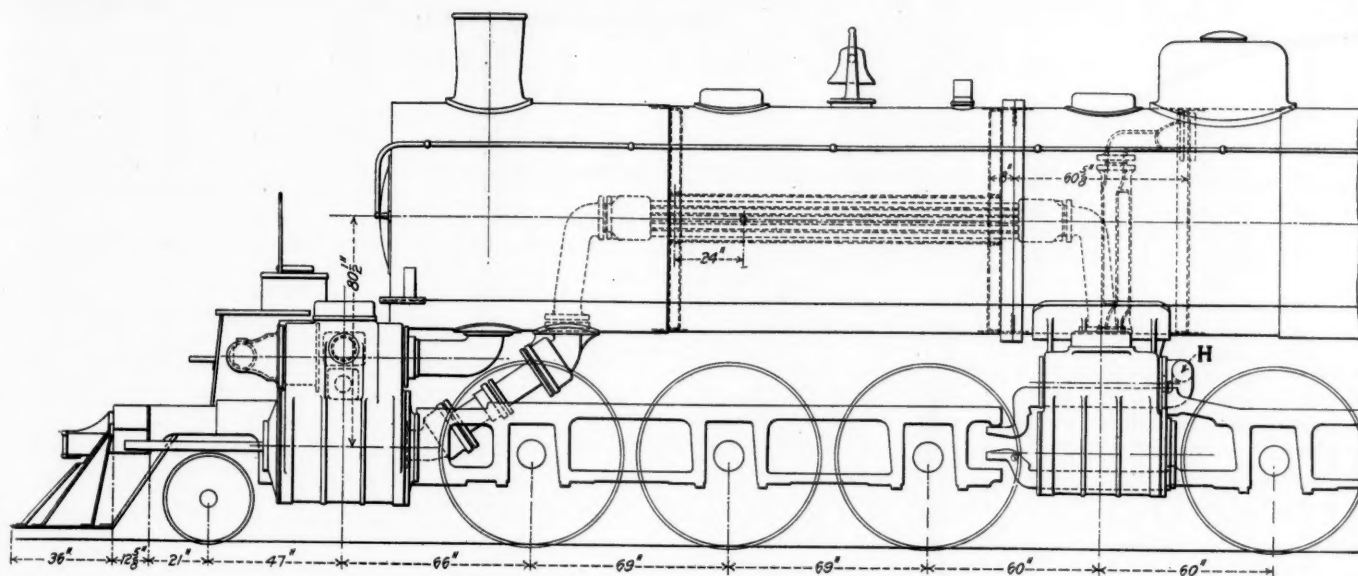


High Pressure Saddle.

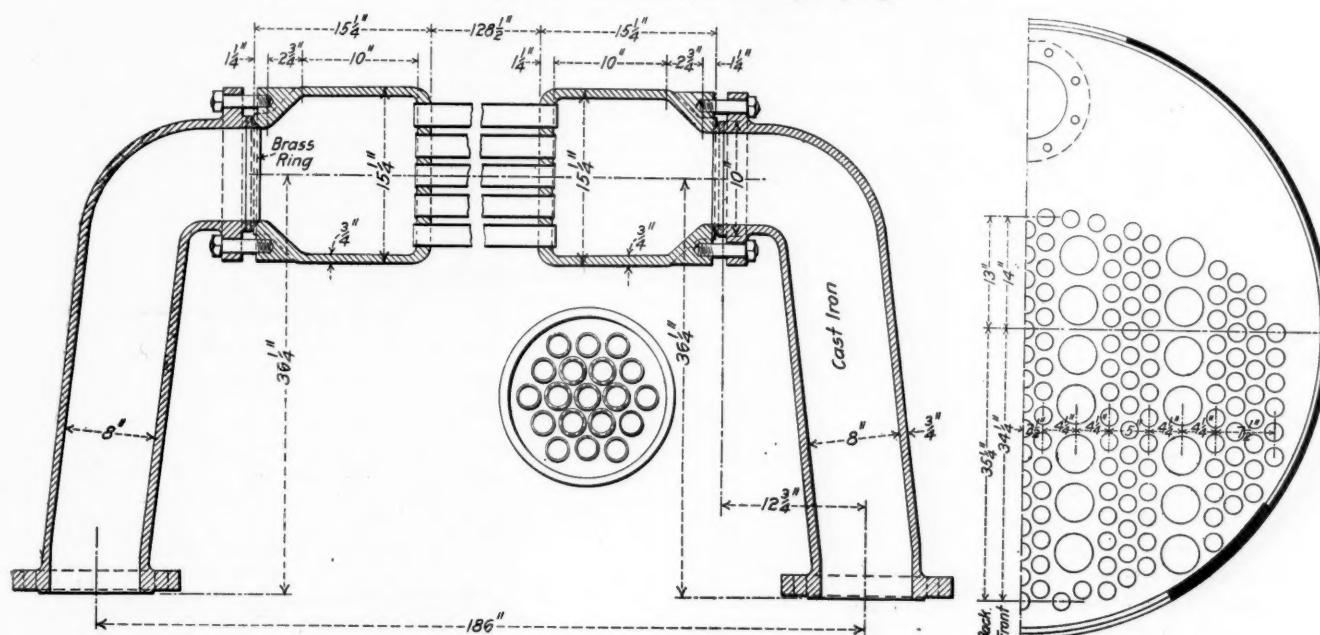
on the center line and fitted with a universal joint. Both valve motions are simple in design and have eccentric rods of ample length. The links of the front engine are trunnioned on cast steel supports, which are placed outside the second pair of drivers and span the distance between the two waist bearers.

In order to avoid flexible oil pipe connections the low pressure cylinders are lubricated by two sight feed oil pumps driven from the forward valve motion. The high pressure cylinders are lubricated from the cab in the usual manner.

The tender is designed in accordance with the railway company's practice. The frame is composed of 12-in. steel channels and the tank is of the water bottom type. The

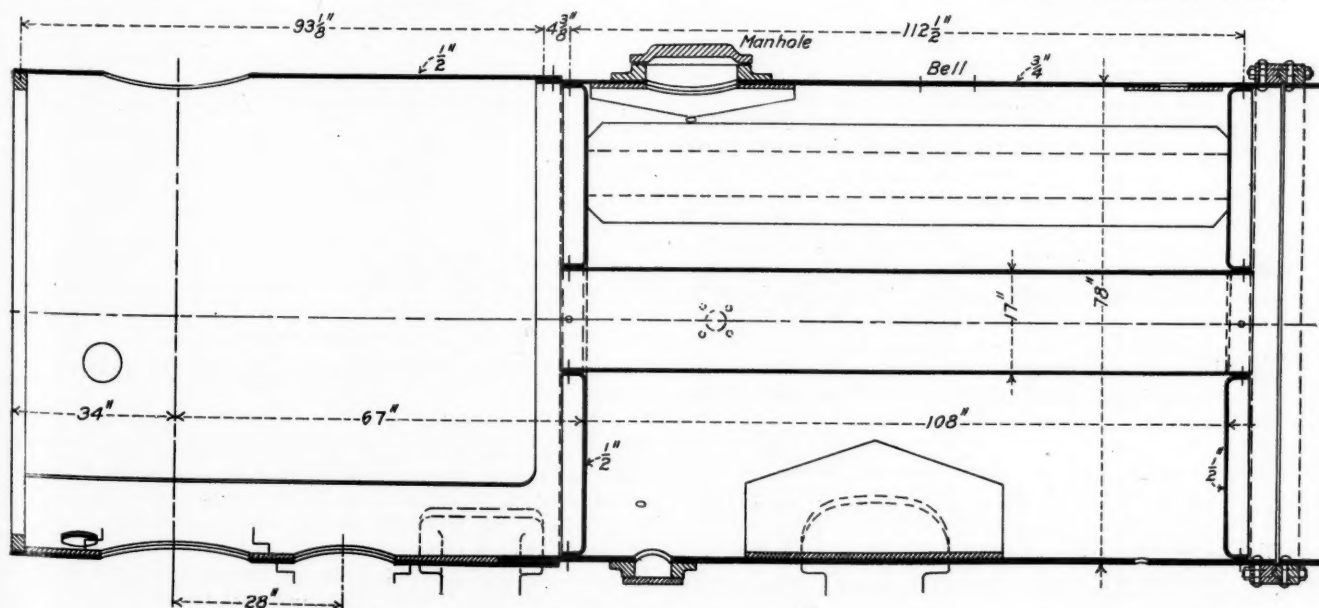


Part Side Elevation, Showing Piping.

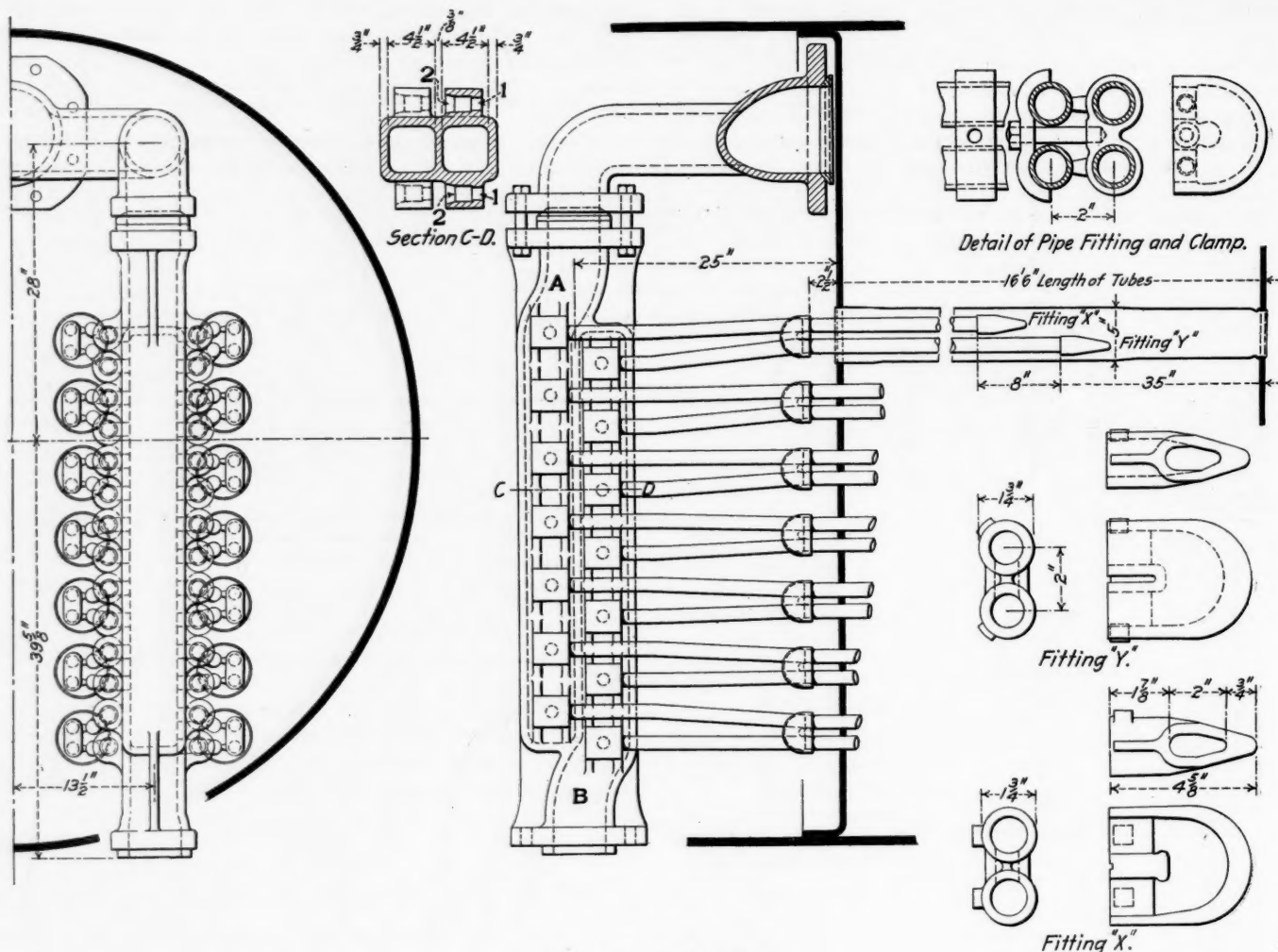


Emerson Reheater.

Half Section of Boiler.



Front Part of Boiler, Showing Feed Water Heater and Reheater Flue.



Emerson Superheater.

trucks are of equalized pedestal design with "Standard" forged and rolled steel wheels having rims 3 in. thick.

These locomotives are of exceptional capacity, and the heating surface of the feed-water heater is greater than that provided in any engines previously constructed by the builders. The principal dimensions are presented in the following table:

	Ratios.
Weight on drivers ÷ total weight.....	84.19*
Weight on drivers ÷ tractive effort.....	4.32
Total weight ÷ tractive effort.....	5.13
Tractive effort x diam. drivers ÷ heating surf.	886.44
Heating surface ÷ grate area.....	79.78
Firebox heating surface ÷ total heat'g surface	4.12*
Weight on drivers ÷ total heating surface.....	59.82
Total weight ÷ total heating surface.....	71.03
Displacement of 2 h. p. cylinders.....	15.39†
Total heating surf. ÷ displacement of h. p. cyls	330.73
Grate area ÷ displacement of h. p. cylinders..	4.14

*Per cent. † Cu. ft.

General Data.

Service	Freight
Fuel	Lignite
Tractive power	70,500 lbs.
Weight on drivers	304,500 "
" on front truck	21,000 "
" on rear truck	36,150 "
" total	361,650 "
" of engine and tender	515,000 "
Wheel base, driving	33 ft. 0 in.
" " rigid	11 " 6 "
" " total	51 " 5 "
" " of engine and tender	83 " 2 1/2 "

Cylinders.

Type	Compound
Diameter	23 and 35 ins.
Stroke	32 in.

Valves.

Type	Balanced piston
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Wheels.

Driving, diameter	64 in.
Driving journals	10 x 12 "
Front truck, diameter	30 "
Front truck, journals	6 x 8 "
Rear truck, diameter	42 1/2 "
Rear truck, journals	8 x 14 "

Boiler.

Working pressure	200 lbs.
Diameter first ring	78 in.
Thickness of sheets	3/4 in.
Firebox, length and width	120 x 78 1/4 in.
" water spaces—front, 4 1/2 in.; sides & back, 4 "	
" sheets, thickness—sides, back and crown, 3/8 in.; tube sheet, 1/2 in.	
" depth, front	75 3/4 in.
" depth, rear	72 1/4 "
Tubes, diameter	5 in. and 2 1/4 "
" material, 5 in.	Iron
" material, 2 1/4 in.	Steel
" thickness, 5 in.	No. 9
" thickness, 2 1/4 in.	No. 11
" number, 5 in.	28
" number 2 1/4 in.	218
" length	16 ft. 6 in.
" feedwater heater, number	406
" feedwater heater, diameter	2 1/4 "
" feedwater heater, length	8 ft. 11 in.
Heating surface, firebox	210 sq. ft.
" boiler tubes	2,708 "
" water heater	2,172 "
" total boiler	5,090 "
" superheater	464 "
Grate area	65.2 "

Tender.

Tank, capacity water	8,000 gal.
Tank, capacity, coal	13 tons
Wheels, diameter	37 in.
Axles, size of journals	5 1/2 x 10 in.

RAILWAY CONCESSION IN STATE OF BAHIA.

Through the efforts of Mr. Pierre Paul Demers, formerly United States Consul at Bahia, Brazil, representing the contract which Henry J. Connill entered into with the state government of Bahia, Brazil, in September for the construction of a railway 62 miles in length has been revised. By the terms of the new contract the line will have a length of about 280 miles, extending from Camamu Bay to the Great Falls on the Jequitinhonha river. The line will traverse a very rich and hitherto unexplored region.

General News Section.

Telephones are now used for despatching trains on the St. Louis & San Francisco between Springfield, Mo., and Monett, and the telephone system is now complete from Kansas City via Springfield to Monett.

The Central of Georgia is dredging for a new slip at its water front property in Savannah, a work which will cost about \$250,000. The contract has been let to the Atlantic Dredging Co., Philadelphia, Pa.

The Western Pacific is now running a regular passenger and freight train daily between Oroville, Cal., and Portola, about 100 miles east. Connection is made by an automobile stage line with Quincy, the county seat of Plumas county.

The city of New York has had its borrowing limit increased by \$97,000,000 by a law which authorizes the omission in computing the debt limit of bonds of the city which are self-sustaining—those issued to build the subway and those representing the cost of docks which have a permanent income.

The United States Civil Service Commission announces an examination, June 15, for candidates for 50 positions as surveyor in the Philippines at \$1,400 a year each. Applicants should write to the Commission at Washington for forms 2 and 375. They do not have to appear at any place for examination.

A compromise has been made at Louisville between the Southern Pacific and the state auditor of Kentucky, which, it is said, will end the litigation over the amount of taxes that this road shall pay. Under the terms of the compromise, the state will receive \$172,500; Jefferson county, \$100,000, and the agent of the auditor, who brought the suit, \$21,000 as penalties. The company is to pay taxes on the following valuations for the years mentioned: 1907, \$5,800,000; 1908, \$8,000,000; 1909, \$9,000,000; 1910, \$9,000,000. The Southern Pacific is a Kentucky corporation but has no property in that state.

President Charles M. Hays, of the Grand Trunk, announces that the company will give three free scholarships, each covering four years, in the Faculty of Applied Science of McGill University, Montreal, to apprentices and other employees of the company under 21 years of age and to minor sons of employees. These scholarships will be awarded under competitive examinations, to be held June 13. Scholarships will be granted for one year and be renewed from year to year, to cover the four years, provided the holder makes satisfactory progress. The holders of these scholarships will be required to serve the road as student apprentices during vacation periods, and, at the option of the company, for two years after completing the college course. The conditions of admission are to be had from the Registrar of the University, Montreal.

Railway Matters in Washington.

Washington, May 11, 1910.

The administration bill finally came to a vote in the House yesterday and was passed by a vote of 200 to 126. Just before the passage of the bill Representative Mann, of Illinois, offered an amendment making mergers of railways legal under certain circumstances. It prohibited mergers of competing lines, but permitted mergers not "substantially competitive," if approved by the Interstate Commerce Commission. This amendment was defeated by a vote of 169 to 160, on the ground that it would break the force of the Sherman anti-trust law. The Democrats made an effort to have the bill recommitted with instructions to eliminate the sections creating the commerce court and to make certain other changes that had been proposed from time to time by the Democrats in the progress of debate. The motion to recommit was defeated—176 to 167.

The Senate has done little on the bill during the past week, a tacit agreement having been reached to postpone action until next week. At the present writing the majority for the administration appears to be more confident that the bill can be passed, but there is still the prospect of discussion of considerable length in conference between the two Houses.

The President's Railway Proposals.

What President Taft proposes to do in the way of amending the Interstate Commerce law has been, in a measure, lost sight of by the confusing and purposeless discussion in Congress, and the amendments that have found favor in one house or the other have left the public in ignorance, not only of what Congress is likely to do, but of what the substance of the discussions really is. At this juncture the President himself has come out in a speech clarifying the situation, and some of the discouraged Congressmen have again assured him that the bill will pass. In this speech, delivered at Passaic, N. J., last Monday, President Taft summarized the administration bill as follows:

"The bill amending the Interstate Commerce law is pending in both houses. It has been amended in the House and also in the Senate. * * * the bill has not been emasculated in either house; it contains almost all of the remedial features of the original administration bill, and those things which have been omitted are neither substantial nor vital.

"In the first place the bill contains a series of sections creating a Commerce Court, which is to absorb all the jurisdiction now had by the Circuit and District Courts on review by injunction suit or otherwise of the proceedings of the Interstate Commerce Commission.

"This court was to be created by five new circuit judges appointed by the President, one of whom was to be supplanted each year by designation of another circuit judge by the Supreme Court. The advantage of the court is that we shall have a court of experts at Washington, very familiar with the whole business of interstate commerce and the decisions affecting it, and will be able to dispose of the business before it promptly and give efficacy to the orders of the Interstate Commerce Commission that are legal.

"The whole object of the court is expedition, and the whole defect of the interstate commerce procedure heretofore has been delay. I regard the Commerce Court as practically the most important feature in the bill. Thus far it has remained in the House, although by a close vote, and it has not been stricken out in the Senate.

"Another feature of the bill is to give the Attorney-General complete control over the litigation after it has left the Interstate Commerce Commission and gets into court. Heretofore the Interstate Commerce Commission itself has controlled the litigation in the courts, and it presented the anomaly of a quasi-judicial tribunal suing in its own behalf to confirm its own judgments. It was thought wiser to give this to the Department of Justice, but amendments have been introduced by which shippers who have an interest may be heard by special counsel if they desire, under regulations of the court.

"Another section requires companies, by their agents, to furnish a statement in writing of the rate applicable to a described shipment between stated places under tariffs to which such company is a party, or a penalty for failure.

"The other provisions authorize the commission not only to review rates, but classifications, and enable the commission of its own motion to investigate the question whether any rate is unjust or unreasonable, or unjustly discriminatory, or unduly preferential, or prejudicial, or otherwise in violation of any of the provisions of the act.

"Another provision requires the commission to establish through routes and joint rates, and to do this upon complaint or upon its own initiative, and it is given to the shippers to select among these routes thus established the route which they prefer.

"Section 13 provides that no railway corporation * * * shall hereafter issue * * * stock except upon the payment of the par value thereof or any bond without payment of not less than the par value thereof; or if sold at less than par, then at not less than its reasonable market or selling value, to be ascertained by the commission; and that no property or other thing than money shall be taken in payment to the corporation for stock or bonds except at its fair value, which shall be ascertained and certified by the commission.

"There are also provisions for reorganization and merger, which contain similar limitations as to the issue of stocks and bonds. The features that I have detailed remain in the bill.

"Two sections have been stricken out. Section 7, attempted to legalize the making of traffic agreements not to last longer than thirty days [no such time limit in the bill as presented.—EDITOR.] between competing lines as to rates, but forbade pooling. This was declared for in the platform and recommended to Congress in two or three messages of President Roosevelt. The purpose was to legalize the practice that will prevail whether the law permits or not.

"It seems to me essential that rates should be fixed temporarily at the same amount in order to prevent a rate cutting where each time the fixing of rates is had. No one suggests the wisdom of instituting prosecutions under the anti-trust law to prevent this practice, and it seemed wise, therefore, to formulate its limitations to continue and recognize it as lawful, but the fear that it might impair the efficacy of the anti-trust law in some indefinite way was so strong among some members of the Senate that it was thought wise to withdraw the section.

"Section 12 was also withdrawn. That is the section that forbids the acquisition by one railway company of the stocks in a competing line, but where such an acquisition has already been made of 50 per cent. authorizes the acquiring company to increase its holdings to 100 per cent.

"This was not with the view of strengthening the control of the acquiring company, for 50 per cent. is all that it needed, but it was to keep open a market to the minority stockholders to sell to the majority stockholders. This, too, it was thought, in some way infringed on the anti-trust law, and the whole section was dropped.

"I am hopeful the section may be restored to the extent of forbidding future acquisition by one line of stock in a competing line. It is true that such an act affecting interstate commerce might be part of a conspiracy to restrain competition and so restrain trade and be punishable under the Anti-Trust act, but it would greatly facilitate prosecutions, if the specific act of the acquisition of stock in a competing line could be denounced and punished or prevented by injunction.

"I think it will be seen from this review that the railway bill, which, in many respects, is the most important of the administration measures, still retains its important features, and I am hopeful that within the next two weeks we shall see the passage of the bill in both houses, the adjustment of the differences between the two houses, and its final enactment.

"It means a great step forward in the power of regulation intrusted to the Interstate Commerce Commission subject to a court review. It does not transfer—and I should be loath to do this—from the board of directors to the Interstate Commerce Commission the power of running and operating the railway. It still leaves wide discretion in the owners of the property, but the powers exercised by the commission, I feel confident, can be exercised for good and will not remove the existing motives of enlightened selfishness for the improvement by the owners of railways in the methods and cost of transportation."

Fire Control on the Great Northern and Northern Pacific.

Secretary Wilson, of the Department of Agriculture, has made an agreement with the Great Northern and with the Northern Pacific for co-operation of the Government Forest Service and the railways to prevent damage to the national forests from fires. The companies agree to clear and keep clear of inflammable material a strip of varying width, as conditions may demand, up to 200 ft. outside of the right of way, and to provide all locomotives which do not burn oil with suitable spark arresters and other standard equipment to prevent the dropping of fire. It is also stipulated that every effort will be made by the companies to operate their locomotives so as not to cause fires. Prompt notification to forest officers of all fires discovered by employees of the railways is provided for, and telephone lines to make this possible will be put up by the Forest Service. Except for salaries of regular employees the cost of fighting fires which start within 200 ft. of the railways will be borne by the com-

panies and of all others by the Forest Service, unless it shall be shown in the first case that the railways were not responsible, or in the second case that they were responsible for the outbreak of the fire.

The Forest Service will regularly patrol the rights of way during the fire season. The Northern Pacific, being a land-grant company, owns a great amount of timber on the alternate sections along its line. The Great Northern, although it is not a land-grant road, also has property at stake in its buildings and the line itself, operation of which may be seriously interfered with by forest conflagrations. The value of heavy timber in mountainous regions as a deterrent to avalanches, landslides and floods is also to be considered as well as the general industrial prosperity of the country.

Tests of Washed Grades of Illinois Coals.

The Engineering Experiment Station of the University of Illinois has issued Bulletin No. 39, by C. S. McGorney. This bulletin presents the results of an elaborate series of boiler tests made in connection with a 210-h.p. brick-set water-tube boiler, equipped with a chain grate stoker. The fuel employed was washed Illinois coal of the various sizes commonly used for steam purposes.

The objects of the tests were: (a) To determine the relation of the size of coal to the economy and rate of evaporation obtainable; (b) To determine the effect of varying rates of combustion upon the economy for each of the different sizes experimented upon; (c) To determine the effect of different depths of fuel beds upon efficiency and capacity; (d) To make a study of the effect of fuel beds upon the draft required.

Comparisons made along these lines and the discussion thereof together with the conclusions drawn constitute the major part of the bulletin. Descriptions of the methods of making and recording furnace observations, and methods for sampling flue gases will be found of particular interest. The following are some of the conclusions derived from the series of tests: (1) The greatest economy was obtained with coal from $\frac{3}{4}$ -in. to 1-in. in size, though the difference in economy obtained from all sizes above $\frac{3}{4}$ -in. was not large; (2) Any rate of combustion commonly employed in stationary practice may be obtained by the use of all the sizes tested except that of $\frac{3}{4}$ -in. and under; (3) The thermal efficiency decreases slightly with an increased rate of combustion and apparently in a linear relation; the horse-power is approximately proportional to the rate combustion; (4) The thickness of the fuel bed, within the limits employed in the experiments, seems to have little effect upon the efficiency, the maximum difference being approximately 2 per cent.

Copies of this bulletin may be obtained gratis upon application to W. F. M. Goss, director of the Engineering Experiment Station University of Illinois, Urbana, Ill.

Samuel Spencer.

At Atlanta, Ga., on Saturday, May 21, the employees of the Southern Railway will dedicate a bronze statue of Samuel Spencer, first president of that company, who was killed in a collision on the road November 29, 1906. The statue is by Daniel C. French and it was paid for by 30,000 employees, each subscribing a fixed percentage of his salary for the month of March, 1907. It is a portrait statue of heroic size, set upon a pedestal of Knoxville marble, and it stands on the plaza of the Atlanta terminal station. The statue will be presented to the state of Georgia and the city of Atlanta by President W. W. Finley and an address will be made by Judge Alexander P. Humphrey, of Louisville.

Long Island Railroad Offices in Manhattan.

The Long Island Railroad has abandoned its plans for putting up a \$1,000,000 office building in Jamaica, and instead will build a less expensive two-story structure to provide offices for the division superintendent, dispatchers, trainmen, paymaster and minor officers.

The principal offices of the company will be transferred about August 1 to the new Pennsylvania Terminal building, at Thirty-third street, Manhattan, where the offices of

the president, general superintendent, real estate agent, purchasing agent and the electrical superintendent will be established. The Long Island will rent the entire third floor of the Pennsylvania station, at the Eighth avenue end of the building. The office space thus acquired will have a frontage of 250 ft. on Thirty-third street, 250 ft. on Thirty-first street, and the whole length of the building on Eighth avenue (about 470 ft.).

Besides the offices of President Peters and the others named, the legal department, the claim department and the general secretary will be moved from Cedar street, Manhattan; the offices of the traffic manager, the general passenger agent and the auditor, from Twenty-ninth street, Manhattan, and the office of the chief engineer of electrical traction, which is a joint office of the Long Island and Pennsylvania roads, will be moved to the Pennsylvania station. About 200 men in all will thus be transferred.

At Jamaica will be the offices of the superintendent, the trainmaster, paymaster, superintendent of police, superintendent of stations, car record office, chief surgeon, relief association and superintendent of express. This will involve the transfer of 100 men from Long Island City.

The offices of the chief engineer and the engineer of maintenance of way, now in Jamaica, will remain there.

Superintendents' Views on Freight Car Interchange.

The American Association of Railroad Superintendents, at its semi-annual meeting in Chicago approved the following uniform interchange rules, and they were recommended to the American Railway Association for adoption, with the exception of rule 5, which was sent to the Master Car Builders' Association:

Rule 1. M. C. B. rules shall govern unless otherwise provided herein.
Rule 2. All cars must be received in interchange, regardless of condition, with the following exceptions:

- (a) Defects constituting violation of the law.
- (b) Empty cars furnished for loading, not safe and serviceable for the commodity to be loaded.
- (c) Empty foreign cars, on an order from the Chief Interchange Inspector (where Chief Interchange Inspectors are employed), if car is found to be in general worn-out condition as outlined in M. C. B. Rules 125 and 126.

Rule 3. Where a shipment of liquids is received in a leaky condition, immediate notice by telephone, to be confirmed in writing, shall be given to the delivering road, but receiving road shall at once take measures to stop the leak, making transfer if necessary, and ascertain, by weighing or measuring, amount of loss up to such time: party at fault to be responsible for any expense incurred under this clause.

NOTE.—It is recommended that each Division show a list of the industries and their location where cars containing liquids may be transferred.

Rule 4. The delivering road shall pay the cost of transfer:

- (a) When transfer is due to defective equipment that is not safe to run according to M. C. B. rules, except when, without making transfers, repairs can be made in 24 hours as per M. C. B. Rule 106. Where allowance for both car under load and empty is made the empty allowance shall be used.
- (b) When transfer is necessary on account of car being improperly loaded according to M. C. B. specifications, provided adjustment cannot be made in equal to 10 working hours of one man, or when due to car being loaded in excess of 10 per cent. above marked capacity.
- (c) When transfer is due to delivering road not desiring its equipment to go beyond junction points.

The receiving road shall pay the cost of transfer:

- (d) When cars cannot pass clearances or be moved through on account of any other physical disability of receiving road.
- (e) When receiving road desires transfer to save cost of mileage or per diem.

Rule 5. Should car be delivered with car owners' or old defects and road receiving damage it further, causing a combination denoting unfair usage, the receiving road will be responsible only for the damage done by it. This rule applies to switch or intermediate movements only.

Opinion on Texas 16-Hour Law.

Assistant Attorney-General Rowland, of Texas, has written an interesting opinion for the State Commissioner of Labor construing the Texas 16-hour law. The Commissioner of Labor inquired if the law was violated in such a case as the following: A crew leaves D for G, a distance of 150 miles, and when it reaches C, which is 50 miles from G, has been on duty 16 consecutive hours. There is another crew right behind it which has been on duty only 6 hours. The first crew is instructed to deadhead to G with the second crew. As soon as G is reached, the crew that was deadheaded from C to G is ordered to take charge of and operate another train, the company claiming that it was off duty during the 10 hours it was being deadheaded. The men say that they cannot rest while being so deadheaded and that when they have worked 16 consecutive

hours they are entitled under the law to spend 10 hours resting at such hotel, boarding-house or other place as they may choose. The opinion of Assistant Attorney-General Rowland as to whether the law is violated or complied with in such a case is as follows:

"The title of the law referred to by you declares that it is 'An act to promote the safety of employees and travelers upon railroads in this state by limiting the hours of service of conductors, engineers, firemen and brakemen.' Section 1 prohibits the requiring or permitting certain classes of railway employees therein named to be or remain 'on duty' for more than 16 consecutive hours and requires that as much as 10 hours 'off duty' shall follow sixteen hours of continuous service. This law nowhere makes use of the word 'rest,' but employs the expression 'on duty' and 'off duty.'

"However, in view of the avowed purpose of the act as stated in its title, it is evident that the idea of rest after 16 hours of continuous service was in the mind of the legislature. If a railway company, after any of its employees of the classes mentioned in said act have been on duty continuously for 16 hours, does not then relieve them from further carrying out its orders for a period of 10 hours, but on the contrary continues to control their actions in furtherance of its own purposes and does so under such circumstances that the men's rest is materially interfered with, we are of the opinion that this is a violation of the law."

Special Train for Mechanical Conventions at Atlantic City.

In accordance with its usual custom the Pennsylvania system will run a fine special, electric-lighted train from Chicago to Atlantic City for the accommodation of members of the American Railway Master Mechanics' Association and the Master Car Builders' Association and their friends desiring to attend the conventions of these associations at Atlantic City, June 15-22. The train will leave the Union Station at Chicago at 3 p.m., Monday, June 13, and reach Atlantic City at 12 o'clock, noon, the following day. It will be composed of modern Pullman sleepers, observation cars, library, smoking and Pennsylvania dining cars. The fare will be \$26 for the round trip. Tickets will be on sale with 30 days return limit, and will permit of stop-over privileges at Philadelphia, Washington, Baltimore and Pittsburgh, returning. Should it be desired, however, to have the privilege of stopping at Washington and Baltimore, it will be necessary to so state at the time of purchasing tickets. Diagrams are now in the office of the city ticket agent of the Pennsylvania lines at 248 South Clark street, Chicago. Reservations may be made by applying to him, or to G. G. Beltzhoover, district passenger agent, Chicago.

Increases of Pay.

The yard men of the New York, New Haven & Hartford will receive increases of pay based on those granted to yard men on the New York Central, as announced in another column.

The Erie has increased the pay of firemen 6 per cent.; and to those who fire the heaviest engines a much larger increase will be given.

Dr. Neill, the government mediator, has been taking testimony on the question of the pay of the telegraphers of the Seaboard Air Line.

The Missouri, Kansas & Texas and the Kansas City Southern have increased the pay of machinists three cents an hour.

Negotiations between the Erie Railroad and its conductors and trainmen were ended last week without agreement. The men are voting as to further action, the result of the vote to be announced May 16.

The Pennsylvania Railroad has granted certain increases of pay to its telegraphers, in addition to the general increase recently made. It also extends passes to more employees in the telegraph department, and has made a change in the rule for bidding in vacancies.

The Wabash-Pittsburgh Terminal has increased the wages of machinists and shop men, effective June 1. The raise is said to average something over 5 per cent.

The Chicago, Rock Island & Pacific has made a flat increase of three cents per hour in the pay of machinists.

The threatened strike of freight-handlers in Chicago will not take place. By a unanimous vote of the members of the Brotherhood of Freight-Handlers in favor of accepting the compromise offered by the roads an increase of two cents an hour in the wages of the men paid by the hour and \$5 a month to those paid by the month was accepted.

New York Central Wages.

The decision of the arbitrators, E. E. Clark and P. H. Morrissey, on the wages of conductors and brakemen on the New York Central, gives the men practically all they asked for except on the long passenger runs (440 miles), and in the matter of double heading. The rates awarded for passenger runs of 5,500 miles a month and those awarded to through freight conductors on the main line are less than asked for and less than the standard, but on the first of next January these classes are to have the standard rates.

The arbitration covered the pay and certain conditions of employment of passenger and freight conductors, assistant conductors, baggagemen, brakemen, flagmen, yard conductors and yard brakemen. The agreement to arbitrate was signed April 12, and the award takes effect as of April 1. The report of the arbitrators says:

"For many years rates of pay of trainmen and yardmen in the territory east of Chicago, St. Louis and the Mississippi river have been lower than in the territory west of that line, and the differences were widened by substantial increases secured on the western lines in 1903 and 1907. The employees on the eastern lines had their requests and proposals for increases of pay all ready for submission to the managements of the roads when the financial depression of 1907 occurred.

"Differing views have always been entertained and expressed as to the effect that should be given to changes in the cost of living. Whatever opinions may be held in connection with temporary fluctuations in such cost it must be and is conceded that present conditions warrant and require readjustment of wages of men who, like those here involved, have not had such readjustment. Evidently we have reached a permanently new basis of living and living costs which calls for substantial increase in wages to these men.

"It happened that the efforts of the employees * * * were first made on the Baltimore & Ohio, and modifications made in that settlement necessarily established precedents of great weight. * * *

"* * * We shall award the rates and rules which we regard as the proper standards in this territory. At the same time we shall prescribe certain exceptions, due to local conditions, which are peculiar to this line, and shall postpone the effective date of a part of the increases awarded, solely because the increases and the percentage of increase necessary to reach those standards on this system are much greater than were necessary on any system in this territory upon which settlement has been made, and much greater than will be necessary on any system in this territory of which we have knowledge."

The arbitration is set forth under 16 heads. The arbitrators first name the rates asked for (which were the same as those demanded of the B. & O.); next the rates actually agreed on in the B. & O. negotiations, and then the award. We omit the original demands as, when the matter finally went to arbitration, the employees, in substance, demanded nothing higher than what they had got from the B. & O.

ARTICLE A—PASSENGER RUNS.

B. & O. rates (cents per mile): Passenger conductors, 2.68; minimum per month, \$125. Baggagemen handling express, 1.65; minimum \$79. Baggagemen not handling express, 1.55; minimum per month, \$75. Brakemen, 1.50; minimum per month, \$70.

The New Haven and the Boston & Maine granted these rates and made minimum rates per day of 10 hours or less as follows: Conductors, \$4.20; assistant conductors, \$3.35; baggagemen, \$2.75; brakemen, \$2.55.

The arbitrators are impressed with the force of the New York Central's argument that its long runs are easier on

the men, and they find established precedents for differentiating between fast through trains on long runs and slower trains and shorter runs; and they award the following as the standard passenger-train rates (in cents per mile):

Conductors	2.68
Assistant conductors	2.15
Baggagemen	1.55
Rear trainmen (flagmen)	1.525
Brakemen	1.50

Exceptions.—Men running through between New York or Weehawken and Buffalo or Suspension Bridge: Conductors, 2.40; baggagemen, 1.39; rear trainmen, 1.37; brakemen, 1.34.

On through passenger runs (on the principal divisions) other than those in the preceding paragraph, on which the crews run more than 5,500 miles a month: Conductors, 2.50; baggagemen, 1.45; rear trainmen, 1.42; brakemen, 1.40; but on January 1 next the men covered by this paragraph shall have the standard rates of 2.68, etc. On all shorter runs the arbitrators leave the rates to be adjusted between the company and the men, but award that these men shall have their pay increased in harmony with the relation of their runs to the longer runs.

ARTICLE B—SHORTER PASSENGER RUNS.

On runs of less than 155 miles a day the minimum allowances shall be, for each day the men are used, as follows: Conductors, \$4.20; assistant conductors, \$3.35; baggagemen, \$2.75; brakemen, \$2.55. These day-rates, it will be seen, are the same as those granted on the New Haven. Regularly assigned employees who report for duty the entire month and do not lay off of their own accord are to receive minimum sums per month, excluding overtime, as follows (same as B. & O. and New Haven except as to rear trainmen): Conductors, \$125; assistant conductors, \$100; baggagemen, \$75; rear trainmen, \$72.50; brakemen, \$70.

ARTICLE C—MINIMUM DAY—PASSENGER.

Ten hours or less, 155 miles or less to be a day's work, overtime to be computed from the time men are required to report and do report for duty, and to continue until they are relieved from duty at the end of the run; rates for overtime per hour: Conductors, 42 cents; assistant conductors, 33 cents; baggagemen, 25 cents; rear trainmen, 24 cents; brakemen, 24 cents. Overtime is to be computed for each employee on the basis of actual time. The arbitrators hold that there is no good reason why the employee should work 29 minutes for nothing or why the company should pay one hour's pay for 31 minutes overtime.

New York Central passenger train employees on short turn-around runs, no single trip of which exceeds 80 miles, including suburban service, shall be paid overtime for all time actually on duty or held for duty in excess of eight hours (computed on each run from the time required to report for duty to end of that run) within 12 consecutive hours; and also for all time in excess of 12 consecutive hours computed continuously from time first required to report to final release at end of last run. All other New York Central passenger train employees shall be paid for overtime on the basis of 20 miles per hour, computed from the time required to report for duty until released, and separately for each part of a round-trip run. This paragraph, being an innovation, takes effect June 1.

In passenger train service on the Boston & Albany the Boston-Springfield and Springfield-Albany runs shall be paid overtime on the above basis of 20 miles per hour. On all other Boston & Albany passenger runs ten hours or less shall constitute a day, and all time in excess of ten hours, computed continuously from the time required to report to final release at the end of last run, shall be paid for as overtime.

ARTICLE D—MILK TRAINS.

Pay to be increased by the same percentage as in through freight service.

ARTICLE E—NO REDUCTION IN CREWS.

Reductions in crews and increases in mileage shall not be made for the purpose of offsetting the increases in wages; but this shall not prevent readjustment of runs in short turn-around and suburban service that are paid for under minimum rules, provided the number of crews is not reduced.

ARTICLE F—THROUGH AND IRREGULAR FREIGHT.

The arbitrators grant the B. & O. rates: Conductors, 3.63

cents a mile; flagmen, 2.525; brakemen, 2.42. Runs of less than 100 miles to be paid for 100 miles; but by agreement certain employees may make two or more short runs in continuous service without being entitled to 100 miles for each trip. On the main line these rates are not to take effect until January 1 next; until that time the rates shall be: Conductors, 3.4 cents; brakemen, 2.35 cents.

ARTICLE G—LOCAL FREIGHTS.

The arbitrators grant the B. & O. rates: Conductors, \$3.975 per day; flagmen, \$2.80; brakemen, \$2.70. Ten hours or less, or 100 miles or less, will constitute a day.

ARTICLE H—MINIMUM DAY—FREIGHT.

Ten hours or less, or 100 miles or less, a day's work. On runs of over 100 miles overtime will be paid on a basis of speed of 10 miles an hour. Time to be computed from hour of reporting to hour released, as in passenger service. On the New York Central heretofore time has been computed from 30 minutes before the leaving time of the train. The arbitrators hold that where men have duties to perform before leaving they should be paid for the time thus occupied.

ARTICLE I—WORK TRAINS, ETC.

Work and wrecking trains to be paid through freight rates, except that the present minimum of \$2.50 a day for brakemen shall be continued.

ARTICLE J.

Mixed trains, pushers, etc., to remain in the classes that they are now in and to have the same increases as the other freight men in those classes.

ARTICLE K.

Rates for special or incidental services to be increased in harmony with the other increases.

ARTICLE L—DEADHEADING.

An inflexible rule is impracticable. On the Boston & Albany trainmen deadheading have received full pay, and this rule shall be continued, with an exception as to extra men. On the New York Central men deadheading on passenger trains will have one-half mileage rates for the class of service in which they are engaged; on freight trains, full mileage rates; when running with light engines or with engine and caboose, through freight rates; this on both roads.

ARTICLE M—DOUBLE HEADING.

The demand was for discontinuance of double heading with trains of over 30 cars, except in case of inclement weather and in case of accident, etc. On the B. & O. this was not granted, and it was agreed that an effort should be made to have a conference, on this subject, with all the roads in the eastern territory, and the New Haven and the Boston & Maine left the question in the same situation.

The percentage of double heading in freight service on the New York Central is small, and therefore the arbitrators decide that the N. Y. C. and the B. & O. shall join in the proposed conference.

ARTICLE N—PAY OF YARDMEN.

The men demanded the Chicago rates. Since that demand was presented the Chicago rates have been increased three cents an hour, and the N. Y. C. and the B. & A. previous to the arbitration had voluntarily made the same increase. But there are six different scales of pay. On the B. & A., the New Haven and the B. & M., the different yards were classified in groups, according to the importance of the yard. The arbitrators think there should be only three groups, and for the highest group they award one cent an hour less than the Chicago rates, which will make the rates the same as those which have for a long time prevailed at Buffalo and at New York City, and which have recently been adopted at Cleveland. The award, therefore, for all of the large yards is, in cents per hour: Day conductors, 37; night conductors, 39; day brakemen, 34; night brakemen, 36. In one yard on the B. & A. and 11 yards on the N. Y. C. the rates are one cent less than these in each case, and in all other yards they are two cents less. In all yards the day's work is ten hours; actual overtime to be paid for pro rata.

ARTICLE O—NO RATES TO BE REDUCED.

Neither this award nor any minor adjustment made under it shall reduce a compensation now paid for any service.

In numerous instances at present employees have certain

days off, which privilege affects the compensation. These allowances are in general to be abolished. The pay of baggage-men who handle express business is left to be settled between the officers and the committees of employees, but their increases must be in harmony with those awarded. Numerous allowances for constructive mileage are to be discontinued, with certain exceptions.

ARTICLE P—SIXTEEN-HOUR LAW.

This proposal developed no substantial difference of opinion between the parties to this arbitration, and the award is:

(a) Under the laws limiting the hours on duty, crews in road service shall not be tied up unless it is apparent that the trip cannot be completed within the lawful time; and not then until after the expiration of 14 hours on duty under the Federal law, or within two hours of the time limit provided by state laws if state laws govern.

(b) If road crews are tied up in a less number of hours than provided in the preceding paragraph, they shall not be regarded as having been tied up under the law, and their services shall be paid for under the pay schedule of the road.

(c) When road crews are tied up between terminals under the law, they shall again be considered on duty and under pay immediately upon the expiration of the minimum legal period off duty applicable to the crew, provided the longest period of rest required by any member of the crew, either eight or ten hours, shall be the period of rest for the entire crew.

(d) A continuous trip shall cover movement straight-away or turn-around from initial point to the destination train is making when required to tie up. If any change is made in the destination after the crew is released for rest, a new trip shall commence when the crew resumes duty.

(e) Road crews tied up under the law shall be paid the time or mileage of their schedule, from initial point to tie-up point. When such crews resume duty on a continuous trip, they shall be paid miles or hours, whichever is the greater, from the tie-up point to the next tie-up point, or to the terminal. This does not permit crews to be run through terminals unless such practice is permitted under the pay schedule.

(f) Road crews tied up for rest under the law, and then deadheaded into terminal, with or without caboose, shall be paid therefor as per paragraph (e) the same as if they had run the train to such terminal.

(g) Train employees tied up in obedience to law shall not be required to watch or care for engines or perform other duties while so tied up.

(h) Yard employees who are relieved for rest in compliance with law shall be permitted to resume work when the lawful rest period is up and to work ten hours or be paid for ten hours.

Investigation of Western Indiana Real Estate Deals and the Alleged Legislative "Slush Fund."

Wm. J. Henley, formerly president of the Chicago & Western Indiana, was on May 6 indicted by a state grand jury at Chicago for the alleged embezzlement from the road of \$28,000 on May 9, 1907. The indictment of Mr. Henley grew out of an investigation begun by the state's attorney of Cook county, Ill., of alleged bribery of members of the legislature of Illinois to secure the passage of House Bill No. 777, which was enacted to remove a cloud from a bond issue of the Chicago & Western Indiana. The indictment of Mr. Henley seems to have been based on testimony given by John C. Fetzer, Benjamin Thomas, who preceded Mr. Henley as president of the road, and Charles R. Kappes, its former real estate agent, who are being sued by the road for alleged frauds in the purchase of real estate for it.

At the time House Bill No. 777 was passed, Mr. Henley was general solicitor of the road. Members of the state's attorney's staff at Chicago are quoted as saying that the \$28,000 in question was paid to Mr. Henley by Mr. Fetzer for distribution among members of the legislature to procure the passage of the bill in question. No accounting was made of the money, according to the company's books, and it is alleged that Mr. Henley either did distribute it among the legislators or kept it himself.

All of the directors and several of the officers of the Chicago & Western Indiana were called to testify before the grand

jury. It is understood that F. A. Delano, president of the Wabash, and other directors told the grand jury of the alleged frauds committed against the road by Thomas, Fetzer and Kappes. The directors who testified all said that they had no knowledge of the bribing of legislators and that they did not believe that there was any bribery in connection with the enactment of House Bill No. 777.

Telephone Train Dispatching on the Great Northern.

The Great Northern has begun the installation of a very extensive telephone train dispatching system, which will involve the stringing of approximately 4,600 miles of wires and the installation of 726 telephone stations. It is expected to have all this installation completed by Jan. 1, 1911.

The service is now being installed on the Spokane division from Troy, Mont., to Leavenworth, Wash., a distance of 337 miles, and will be in operation within the next three weeks. Materials and equipment are also being assembled for the installation of the service on the following divisions: Lake District, 455 miles. Fergus Falls division, Minneapolis to Barnesville, Minn., and Willmar to Sandstone, Minn., 348 miles. Breckenridge division, Breckenridge, Minn., to Devil's Lake, N. D., and Casselton, Minn., to Larimore, N. D., 255 miles. Northern division, Barnesville, Minn., to Crookston, Minn., 348 miles. Dakota division, Barnesville, Minn., to Neche, N. D., and Redland, Minn., to Devil's Lake, N. D., 301 miles. Cascade division, Leavenworth, Wash., to Seattle, Wash., and Everett, Wash., to Vancouver, B. C., 265 miles.

Questions for Discussion at the International Railway Congress.

Following is a list of the questions which are to be discussed at the eighth session of the International Railway Congress, to be held at Berne, Switzerland, next July, together with a list of the reports that are to be made, i.e.: under the first subject a report is to be made covering France, Belgium, Italy, Spain and Portugal; another covering Austria-Hungary, Rumania, etc.; another covering countries using the English language, and another for all other countries. We give the names of the "reporters" who will represent English-speaking countries.

SECTION I.—WAY AND WORKS.

I.—RAIL-JOINTS.

A. Reduction in the number of joints by increasing the length of the rails. Maximum length to be adopted for ordinary track rails. The welding of rail-joints.

B. The strengthening of rail-joints.

France, Belgium, Italy, Spain and Portugal; Austria-Hungary, Rumania, Bulgaria, Serbia, Turkey and Egypt; Countries using the English language, Mr. Ross, Great Northern Railway, London; Other Countries.

II.—STRENGTHENING THE TRACK AND THE BRIDGES WITH A VIEW TO INCREASING THE SPEED OF TRAINS.

A. Increasing strength of road on account of increased weight of locomotives and speed of trains. Means for increasing the speed on curves without increasing the superelevation of the outer rail to a corresponding extent. Economy of maintenance to be realized from the use of a stiffer track. Cross-section and quality of the rail. The spacing of wooden sleepers and their seats. Substitution of other materials for wood in making sleepers.

B. The suitable strengthening of existing metal bridges proportionately to the increase in the weight of the locomotives and in the speed of the trains.

Austria-Hungary, Bulgaria, Rumania, Serbia and Turkey; America, Mr. Byers, Missouri Pacific, St. Louis; Spain and Portugal; France and Italy; Holland and Belgium; Russia; Great Britain, Mr. Jacomb-Hood, London & South Western, London; Other Countries (A); Other Countries (B).

III.—JUNCTIONS AND SWING-BRIDGES. ELIMINATION OF SLACKING. Arrangement of the road appliances for passing at high speed over switches and swing-bridges.

France, Italy, Spain and Portugal; Great Britain, Mr. Morgan, London, Brighton & South Coast, London; America, Mr. Besler, Central of New Jersey, New York; Other Countries.

IV.—LONG RAILWAY TUNNELS.—CONSTRUCTION, VENTILATION AND OPERATION.

Methods used in constructing, ventilating and operating long railway tunnels.

Submarine tunnels; Alpine tunnels; Great town tunnels in Great Britain, Mr. Fox, consulting engineer, 28 Victoria street, Westminster, London; tunnels in mountainous countries (the Alps excepted) and great town tunnels (Great Britain excepted).

SECTION II.—LOCOMOTIVES AND ROLLING STOCK.

V.—THE USE OF STEEL. SPECIAL STEELS.

A. Use of steel in the construction of locomotives and rolling stock; freight and passenger wagons entirely of steel.

B. Use of special steel of high resistance in the making of the various parts of locomotives and rolling stock (tires, axles, springs, couplers, boilers, etc.).

America (A), Mr. Crawford, Pennsylvania Lines West of Pittsburgh, Pittsburgh; All Countries except America; America (B), Mr. Ettenger, Southern Railway, Washington; Countries belonging to the German Railway Union; Great Britain (B), Mr. Worsdell, North Eastern Railway, Gateshead; Other Countries.

VI.—IMPROVEMENTS IN LOCOMOTIVE BOILERS.

A. Boilers with smoke tubes; precautions in constructing and maintaining tubes and tube-plates.

B. Boilers with water tubes. Steam superheaters and valve gear for superheated steam. Feed water heaters.

C. Damages to boilers, blisters, cracks and corrosions. Means employed for preventing these damages. Purification of the water and disinfectants or antifouling compounds.

Russia (A and C); America (A and B), Mr. Vaughan, Canadian Pacific, Montreal; Austria-Hungary, Rumania, Bulgaria, Serbia and Turkey (B); Russia; France, Belgium, Italy, Spain and Portugal (B); Austria-Hungary, Rumania, Bulgaria, Serbia and Turkey (A and C); France, Belgium, Italy, Spain and Portugal (A and C); Great Britain, Mr. Fowler, Midland Railway, and Mr. Archbutt, Midland Railway, Derby; Other Countries.

VII.—STEAM LOCOMOTIVES FOR VERY HIGH SPEEDS.

Steam locomotives for obtaining regulation speeds exceeding 60 miles an hour.

America, Mr. Garstang, Cleveland, Cincinnati, Chicago & St. Louis, Indianapolis; Other Countries.

VIII.—ELECTRIC TRACTION.

Electric traction on large railways. Continuous current. Alternating current (monophase or polyphase). Comparative net cost.

Germany; America, Mr. Gibbs, Long Island Railroad, New York; Other Countries.

SECTION III.—WORKING.

IX.—LARGE STATIONS.

A. *Large passenger stations.*—Best arrangement of tracks so as to increase their working capacity and ensure safety in shunting operations. Improved mechanical appliances for the conveyance of luggage, etc.

B. *Large goods stations.*—(1) Arrangements of tracks: (a) to allow the continuity of movement of vehicles which require shunting and which are separate from the time the train bringing them has arrived until the train taking them away is being made up; (b) to prevent such movement from being interfered with by the arrival or departure of trains; (c) to stop without shock such separate vehicles at the end of the successive movements required; (d) to start them off again.

(2) New appliances for handling goods.

America, Mr. Jaggard, Pennsylvania Railroad, Elmira; Russia, Austria-Hungary, Rumania, Bulgaria, Serbia and Turkey; Other Countries.

X.—OPERATION OF SWITCHES AND SIGNALS.

A. Improved centralized installations for operating switches and signals. The use of water, of compressed air, of electricity, for working the transmissions. Electric interlocking. Route levers.

B. Arrangements adopted to prevent switches taken from the facing or the trailing side from changing their position before the whole train has passed.

C. Use of diagrams to facilitate the consideration of the

full utilization of tracks along passenger platforms and the modifications to be made, in cases of urgency, in the way these tracks are used.

Holland; Austria-Hungary, Bulgaria, Denmark, Germany, Luxemburg, Norway, Rumania, Russia, Servia, Sweden, Switzerland and Turkey; America, Mr. Carter, Chicago & North Western, Chicago; Other Countries.

XI.—PASSENGER TICKETS.

Different types of passenger tickets. Systems enabling the number of blank tickets to be reduced. Simplified tickets for stopping places. Apparatus for printing tickets (and checking them) as and when required.

All Countries.

XII.—MOTOR VEHICLES.

The use and cost of motor vehicles or self-moving cars.

Great Britain, Mr. Riches, Taff Vale Railway, Cardiff; America, Mr. Clark, Buffalo & Susquehanna Railroad, Buffalo; Other Countries.

SECTION IV.—GENERAL.

XIII.—RAILWAYS AND WATERWAYS.

The investigation of the influence of waterways considered as feeders and as competitors, on railways.

Great Britain, Mr. Jebb, Shropshire Union Railways and Canal Company, Birmingham; America, Mr. Hoyt, New York Central Lines, Rochester; Other Countries.

XIV.—STATISTICS.

A. Principles of statistics of railways in operation.

B. Uniform classification of working expenses.

Great Britain, Mr. Acworth, The Albany, Piccadilly, London W.; English Colonies, Mr. Price, general manager, Central South African Railways, Johannesburg; Other Countries.

XV.—MOTOR CAR SERVICES.

Porterage, cartage and connecting services by motor car.

All Countries, Mr. Inglis, Great Western Railway, London.

XVI.—PERISHABLE GOODS.

Suitable measures for developing the traffic in perishables; packing, refrigerator vans, appliances for keeping temperature constant, etc.

Countries using the English language, Mr. Culp, Southern Railway, Washington; Other Countries.

SECTION V.—LIGHT RAILWAYS.

XVII.—LINES BELONGING TO MAIN RAILWAYS BUT HAVING NOT MUCH TRAFFIC.

Simplification in operating lines belonging to main railways but having not much traffic.

All Countries.

XVIII.—THE WORKING OF LIGHT RAILWAYS.

Examination of the results of the different systems used in operating light railways (leasing, operating jointly with corresponding main railway, working by concessionary himself, with or without guarantee or subvention from the authorities granting the concession.)

All Countries.

XIX.—LOCOMOTIVES AND ROLLING STOCK OF NARROW-GAGE LIGHT RAILWAYS.

A. Types of the latest locomotives used on narrow-gage light railways, with due consideration to the profile of the line and the class of traffic.

Is it advisable: (1) to protect the wheels and the moving parts by a metal cover; (2) to have a foot-plate at each end of the locomotive? What regulations are there on the subject?

B. What are the latest types of carriages and wagons used on narrow-gage light railways?

All Countries.

XX.—TRANSHIPMENT.

Examination of the different systems adopted for the exchange of goods between lines of different gages (transshipment at the same level, sunk or raised tracks, trucks for taking cars of another gage, tracks with three or four lines of rails, etc.).

All Countries.

NOTE ON THE UTILITY OF STUDYING THE QUESTION OF FREIGHT CAR INTERCHANGE AND DEMURRAGE.

A. Regulations for the interchange use of freight cars be-

tween railways and penalties for delays and misuse of freight cars by railways.

B. Regulations to prevent delays and misuse of freight cars by shippers and consignees.

By Mr. Allen, secretary, American Railway Association, New York.

American Society of Mechanical Engineers.

At the spring meeting to be held at Atlantic City, N. J., May 31-June 3, the following papers will be read and discussed:

Machine Construction and Operation.

The Shockless Jarring Machine. Wilfred Lewis.
A Comparison of Lathe Headstock Characteristics. Prof. Walter Rautenstrauch.

The Strength of Punch and Riveter Frames made of Cast Iron. Prof. A. L. Jenkins.

Improved Methods in Finishing Staybolts and Straight and Taper Bolts as Used in Locomotives. C. K. Lassiter.

Gas Power.

A Regenerator Cycle for Gas Engines Using Sub-Adiabatic Expansion. Prof. A. J. Frith.

Gas Engines for Driving Alternating-Current Generators. H. G. Reist.

Two Proposed Units of Power. Prof. Wm. T. Magruder.
Some Operating Experiences with a Blast Furnace Gas Power Plant. H. J. Freyn.

Miscellaneous Papers.

The Mechanical Engineer and the Textile Industry. H. L. Gantt.
The Elastic Limit of Manganese and Other Bronzes. J. A. Capp.

The Hydrostatic Chord. R. D. Johnson.
The Resistance of Freight Trains. Prof. Edw. C. Schmidt.

Power Transmission.

Improvements in Lineshaft Hangers and Bearings. Henry Hess.
Experimental Analysis of a Friction Clutch Coupling. Prof. Wm. T. Magruder.

An Improved Absorption Dynamometer. Prof. C. M. Garland.
Critical Speed Calculation. S. H. Weaver.

Western Railway Club.

The annual meeting of the Western Railway Club will be held at the Auditorium Hotel, Chicago, on Monday evening, May 16, instead of on Tuesday, May 17, the date fixed by the by-laws. The reason for this change is that it has been the custom to have an evening of entertainment following the election of officers, and on this occasion it has been arranged that Frank L. Smith, cashier of the Corn Exchange National Bank, Chicago, will give his illustrated monologue on "Early Railroad and other Things in and Around Chicago." Every old railway man in and around Chicago has been invited to be present, and an evening of rare historical entertainment and amusing incidents connected with early railway days is promised.

Omaha Railway Club.

At a mass meeting held May 11 George A. Post, president of the Railway Business Association, addressed the club on the subject of railway regulation. The meeting was an open one and was attended by a large number of representative citizens and business men of Omaha, Neb.

International Railway Fuel Association.

At the opening session of the second annual meeting, which will be held at the Hotel La Salle, Chicago, May 23-26, 1910, H. J. Slifer, general manager, Chicago & Great Western, will make an address.

New England Railroad Club.

At the regular meeting held at Copley Square Hotel, Boston, on May 10, a paper entitled "The Section Forces in Railroad" was presented by L. G. Morphy, designing engineer, Boston & Albany.

Imperial Russian Technical Society.

The international exhibition of electricity applied to railways will be held in St. Petersburg, Russia, from August 15 to November 15, 1910.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.; May 10-13; Indianapolis.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa.; June 7, 1910; Niagara Falls, Ont.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—C. M. Burt, Boston, Mass.; next meeting, St. Paul, Minn.

AMERICAN ASSOC. OF LOCAL FREIGHT AGENTS' ASS'NS.—G. W. Dennison, Penna. Co., Toledo, Ohio.

AMERICAN ASS'N OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew Bldg., Cincinnati, Ohio; during first week in month.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York; May 18; New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago; Oct. 18; Fort Worth, Tex.

AMERICAN RAILWAY ENGINEERING AND MAINT. OF WAY ASSOC.—E. H. Fritch, Monadnock Bldg., Chicago.

AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis; second Tuesday, May; Memphis, Tenn.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony Building, Chicago; June 20-22; Atlantic City.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—O. T. Hartoun, Bloomington, Ill.; July 12; Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. Edgar Marburg, Univ. of Pa., Philadelphia; June 28-July 2; Atlantic City.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., N. Y.; 1st and 3d Wed., except July and August; New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 29th St., N. Y.; 2d Tues.; N. Y.; May 31-June 3; Atlantic City.

AMERICAN STREET AND INTERURBAN RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.

ASSOCIATION OF AM. RY. ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; June 29, 1910; Colorado Springs.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—E. H. Hemus, A. T. & S. F., Topeka, Kan.; May 25-27; Chattanooga, Tenn.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, Wis. Central Ry., Chicago; June 20-24, 1910; Los Angeles.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 24 Park Pl., N. Y.; June 21-22; Colorado Springs.

BUFFALO TRANSPORTATION CLUB.—J. N. Sells, Buffalo.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tues. in month, except June, July and Aug.; Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, Montreal, Que.; Thursdays; Montreal.

CAR FOREMAN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month; Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; June 1-4; Harrisburg.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton Building, Pittsburgh; 1st and 3d Tuesdays; Pittsburgh.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Rich. Fred. & Pot. R. R., Richmond, Va.; June 15, 1910; California.

GENERAL SUPERINTENDENTS' ASSOC. OF CHICAGO.—H. D. Judson, 209 Adams St., Chicago; Wednesday preceding 3d Thurs.; Chicago.

INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., N. Y.; May 24-27; Niagara Falls, Ont.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago; May 23-26; Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn.; May 3-7; Cincinnati.

INTERNATIONAL RAILWAY MASTER BLACKSMITHS' ASS'N.—A. L. Woodworth, Lima, Ohio; Aug. 16-18; Detroit, Mich.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11, Brussels; July 4-16; Berne, Switzerland.

IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony Bldg., Chicago; June 15-17; Atlantic City.

NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tues. in month, ex. June, July, Aug. and Sept.; Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.

NORTH-WEST RAILWAY CLUB.—T. W. Flanagan, Soo Line, Minn.; 1st Tues. after 2d Mon., ex. June, July, August; St. Paul and Minn.

NORTHERN RAILWAY CLUB.—Fourth Saturday in month; Duluth, Minn.

RAILWAY ASSOCIATION OF SPECIAL AGENTS AND POLICE OF U. S. AND CANADA.—May 10-13; Los Angeles, Cal.

OMAHA RAILWAY CLUB.—A. H. Christiansen, Barker Bldg.; 2d Wed.

RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City; Third Friday in month; Kansas City.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, Pittsburgh, Pa.; 4th Friday in month, except June, July and August; Pittsburgh.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa.; annual meeting October 11-13; Atlantic City.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C., Collingwood, Ohio; May 16-18; St. Louis.

RICHMOND RAILROAD CLUB.—F. O. Robinson; 2d Monday; Richmond.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.

SOCIETY OF RY. FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Sta., Chicago.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. R. Ry., Montgomery, Ala.; annual, Oct. 20; Atlanta.

SOUTHERN & SOUTHWESTERN R.R. CLUB.—A. J. Merrill, Prudential Bldg., Atlanta; 3d Thurs., Jan., Mar., July, Sept. and Nov.; Atlanta.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August; New York.

TRAIN DESPATCHERS' ASSOC. OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; June 21; Spokane, Wash.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo; annual meeting, Aug. 16-19; Niagara Falls, Ont.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg; 2d Monday, except June, July and August; Winnipeg.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, Monadnock Bldg., Chicago; Wednesdays, except July and August; Chicago.

Traffic News.

The Southern Pacific has put on a new through night train from San Francisco to Los Angeles by the Coast Line. This, with the Owl train of the old line, makes two through night trains each way between the cities named.

The Metropolitan Steamship Co., running the fast passenger steamers "Yale" and "Harvard" through between New York and Boston, around Cape Cod, announces that the service will be begun for the season on May 23. These steamers are to burn oil under their boilers instead of coal, as heretofore.

The Pennsylvania Company has been indicted at Pittsburgh for failure to collect from the American Steel & Wire Co. a reconsignment charge on certain carloads of coke. The coke was first shipped from Youngwood, Pa., to Allegheny, then reconsigned to Newburgh, Ohio. The tariffs provide that a charge of \$2 per car shall be made for reconsigning. The failure to collect this charge is the basis of the indictment.

Following the announcement of increases in commutation ticket rates to New York by the New York, New Haven & Hartford, the reporters gather that all of the prominent lines leading into New York city are preparing to make similar increases; but they do not succeed in getting any definite figures and some of the roads deny that any action has been decided on. Officers of the Long Island road say that no increase is contemplated on that company's lines.

The New York State Senate has adopted an amendment to Assemblyman Parker's public service law amendment bill so as to give the public service commissions power to regulate commutation and mileage rates on railways. A delegation from Westchester county went to Albany to ask Governor Hughes to send a special message to the legislature on this question, but the special message was not needed. This agitation has been brought about by the increases in the New York, New Haven & Hartford commutation rates.

The Illinois Manufacturers' Association has started a movement to oppose the various increases in freight rates that the railways are announcing. Its secretary, John M. Glenn, says that he will call a conference of shippers on this subject which probably will be held at Chicago on May 20. The association is also protesting specifically against the advances in rates on coal from southern Illinois to Chicago and other northern points. At its instance the Illinois Railway Commission has ordered a hearing regarding these rates on May 23. The Illinois and Indiana Coal Operators' Association, the Chicago Association of Commerce and other shippers' organizations are acting with the Illinois Manufacturers' Association.

Through the mediation of the Interstate Commerce Commission the representatives of the trunk lines interested in the rates on import freight from Boston, New York, Philadelphia and Baltimore have come to a temporary agreement. The agreement provides that the Interstate Commerce Commission shall make a full investigation of the rates on import freight at Boston, Philadelphia and Baltimore in the fall, after the resumption of business by the commission. In the meantime the roads running to Philadelphia have agreed not to cut the rate on import freight, so that as matters now stand the rates to New York, Boston, Baltimore and Philadelphia will be all the same. Philadelphia claims a differential rate as compared with Boston.

Traffic Club of Chicago.

On May 10 the Traffic Club of Chicago gave a farewell luncheon in honor of E. A. McCormick, who was recently appointed vice-president in charge of traffic of the Southern Pacific, with office at San Francisco. John T. Stockton presided at the luncheon and S. M. Felton, president of the Chicago Great Western, was toastmaster. The other speakers, all of whom paid high tributes to Mr. McCormick, were J. C. Stubbs, W. A. Gardner and F. T. Bentley. At the speakers' table there were seated Julius Kruttschnitt, John Sebastian, C. G. Burnham, P. C. Stohr, J. G. Woodworth, J. W. Blabon, E. W. McKenna, W. B. Scott, W. L. Ross, General Frederick D. Grant, D. W. Cooke, I. G. Rawn, W. A. Gardner and F. T. Bentley.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF MARCH, 1910.
(See also issue of May 6.)

Name of road.	Mileage operated at end of period.	Operating revenues.			Operating expenses.		Net operating revenues (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decrease) last year.
		Freight.	Passenger.	Total.	Way and structures.	Maintenance of equipment.					
Atchafalaya, Topeka & Santa Fe.....	7,458	\$5,298,517	\$1,875,563	\$7,174,080	\$1,875,563	\$1,875,563	\$5,300,000	.....	\$273,816	\$2,727,140	\$3,576,864
Atlantic Coast Line.....	4,484	2,246,527	698,374	2,944,901	1,180,121	\$1,244,979	\$1,725,780	.....	.....	.....	.....
Baltimore & Ohio.....	4,198*	2,132,820	1,136,235	3,269,055	823,842	1,551,879	2,385,721	.....	.....	.....	.....
Central of Georgia.....	2,242	2,275,814	1,076,996	3,352,810	823,842	1,551,879	2,385,721	.....	.....	.....	.....
Chesapeake & Ohio.....	1,915	2,848,648	236,411	3,085,059	1,176,890	1,908,169	1,908,169	.....	.....	.....	.....
Chicago, Burlington & Quincy.....	1,938	2,848,648	236,411	3,085,059	1,176,890	1,908,169	1,908,169	.....	.....	.....	.....
Chicago, Rock Island & Pacific.....	9,021	5,639,575	1,606,127	7,245,702	1,776,890	5,468,812	5,468,812	.....	.....	.....	.....
Cincinnati, Hamilton & Dayton.....	7,393	3,516,998	1,372,900	4,889,898	1,372,900	3,516,998	3,516,998	.....	.....	.....	.....
Delaware & Hudson Co.....	1,036	578,282	180,166	758,448	180,166	578,282	578,282	.....	.....	.....	.....
Denver & Rio Grande.....	843	1,482,597	180,166	1,662,763	180,166	1,482,597	1,482,597	.....	.....	.....	.....
Erie.....	2,505	1,521,377	353,963	1,875,340	353,963	1,521,377	1,521,377	.....	.....	.....	.....
Illinois Central.....	1,961	3,184,324	682,864	3,867,188	682,864	3,184,324	3,184,324	.....	.....	.....	.....
Louisville & Nashville.....	4,550	3,853,142	926,033	4,779,175	926,033	3,853,142	3,853,142	.....	.....	.....	.....
Moline & Ohio.....	4,594	3,631,724	876,772	4,508,496	876,772	3,631,724	3,631,724	.....	.....	.....	.....
Nashville, Chattanooga & St. Louis.....	1,114	690,817	103,038	793,855	103,038	690,817	690,817	.....	.....	.....	.....
New York, Chicago & St. Louis.....	1,230	667,677	194,339	862,016	194,339	667,677	667,677	.....	.....	.....	.....
Norfolk & Western.....	558	905,260	122,353	1,027,613	122,353	905,260	905,260	.....	.....	.....	.....
Northern Central.....	1,951	2,765,697	304,000	3,069,697	304,000	2,765,697	2,765,697	.....	.....	.....	.....
Oregon R.R. & Nav. Co.....	467	845,634	154,285	1,000,000	154,285	845,634	845,634	.....	.....	.....	.....
Oregon Short Line.....	5,849†	4,086,121	1,071,844	5,157,965	1,071,844	4,086,121	4,086,121	.....	.....	.....	.....
Pennsylvania Co.....	1,476*	755,453	274,578	1,030,031	274,578	755,453	755,453	.....	.....	.....	.....
Philadelphia & Reading.....	1,508	1,170,946	334,708	1,505,654	334,708	1,170,946	1,170,946	.....	.....	.....	.....
Phila., Baltimore & Washington.....	1,415	3,283,723	603,564	3,887,287	603,564	3,283,723	3,283,723	.....	.....	.....	.....
Pitts., Cincinnati & Chicago & St. L.....	3,947	2,777,657	679,349	3,457,006	679,349	2,777,657	2,777,657	.....	.....	.....	.....
Pitts., Cincinnati & Chicago & St. L.....	1,717	2,602,868	593,336	3,196,204	593,336	2,602,868	2,602,868	.....	.....	.....	.....
St. Louis & San Francisco.....	4,726	2,515,246	760,294	3,275,540	760,294	2,515,246	2,515,246	.....	.....	.....	.....
St. Louis Southwestern.....	773	532,305	99,099	631,404	99,099	532,305	532,305	.....	.....	.....	.....
Southern Pacific Co.—Pacific System.....	703	205,046	283,886	488,932	283,886	205,046	205,046	.....	.....	.....	.....
Texas & Pacific.....	6,070†	4,665,319	2,537,922	7,203,241	2,537,922	4,665,319	4,665,319	.....	.....	.....	.....
Union Pacific.....	1,884	921,948	226,860	1,148,808	226,860	921,948	921,948	.....	.....	.....	.....
Vandalia.....	3,411*	3,113,654	426,498	3,540,152	426,498	3,113,654	3,113,654	.....	.....	.....	.....
Wabash.....	827	611,290	175,402	786,692	175,402	611,290	611,290	.....	.....	.....	.....
Yazoo & Mississippi Valley.....	2,515	1,820,582	513,390	2,333,972	513,390	1,820,582	1,820,582	.....	.....	.....	.....
Yazoo & Mississippi Valley.....	1,370	640,141	171,716	811,857	171,716	640,141	640,141	.....	.....	.....	.....
Atchafalaya, Topeka & Santa Fe.....	7,458	43,604,088	15,622,127	59,226,215	15,622,127	43,604,088	43,604,088	.....	.....	.....	.....
Atlantic Coast Line.....	4,484	15,662,123	5,152,892	20,815,015	5,152,892	15,662,123	15,662,123	.....	.....	.....	.....
Baltimore & Ohio.....	4,198*	50,450,421	10,385,582	60,836,003	10,385,582	50,450,421	50,450,421	.....	.....	.....	.....
Central of Georgia.....	2,242	19,124,313	1,048,286	20,172,599	1,048,286	19,124,313	19,124,313	.....	.....	.....	.....
Chesapeake & Ohio.....	1,915	6,345,796	3,704,924	10,050,720	3,704,924	6,345,796	6,345,796	.....	.....	.....	.....
Chicago, Burlington & Quincy.....	1,938	18,829,890	3,009,962	21,839,852	3,009,962	18,829,890	18,829,890	.....	.....	.....	.....
Chicago, Rock Island & Pacific.....	9,021	44,773,783	16,947,018	61,720,801	16,947,018	44,773,783	44,773,783	.....	.....	.....	.....
Cincinnati, Hamilton & Dayton.....	7,393	30,349,232	14,062,428	44,411,660	14,062,428	30,349,232	30,349,232	.....	.....	.....	.....
Delaware & Hudson Co.....	1,036	5,652,393	1,278,877	6,931,270	1,278,877	5,652,393	5,652,393	.....	.....	.....	.....
Denver & Rio Grande.....	843	11,912,488	2,247,309	14,159,797	2,247,309	11,912,488	11,912,488	.....	.....	.....	.....
Erie.....	2,505	12,968,805	4,026,396	16,995,201	4,026,396	12,968,805	12,968,805	.....	.....	.....	.....
Illinois Central.....	1,961	26,127,468	6,482,316	32,609,784	6,482,316	26,127,468	26,127,468	.....	.....	.....	.....
Louisville & Nashville.....	4,550	28,609,389	8,952,060	37,561,449	8,952,060	28,609,389	28,609,389	.....	.....	.....	.....
Moline & Ohio.....	4,594†	1,114	5,779,798	6,894,596	5,779,798	1,114	1,114	.....	.....	.....	.....
New York, Chicago & St. Louis.....	1,230	6,151,180	1,951,856	8,103,036	1,951,856	6,151,180	6,151,180	.....	.....	.....	.....
Norfolk & Western.....	558	6,836,926	1,072,266	7,909,192	1,072,266	6,836,926	6,836,926	.....	.....	.....	.....
Northern Central.....	1,951	22,132,283	2,964,691	25,096,974	2,964,691	22,132,283	22,132,283	.....	.....	.....	.....
Oregon R.R. & Nav. Co.....	467	7,499,906	1,595,893	9,095,799	1,595,893	7,499,906	7,499,906	.....	.....	.....	.....
Oregon Short Line.....	5,849†	35,364,426	16,366,275	51,730,701	16,366,275	35,364,426	35,364,426	.....	.....	.....	.....
Pennsylvania Co.....	1,476*	7,208,933	3,218,445	10,427,378	3,218,445	7,208,933	7,208,933	.....	.....	.....	.....
Philadelphia & Reading.....	1,508	10,627,313	5,689,524	16,316,837	5,689,524	10,627,313	10,627,313	.....	.....	.....	.....
Phila., Baltimore & Washington.....	3,947	89,442,000	23,365,924	112,807,924	23,365,924	89,442,000	89,442,000	.....	.....	.....	.....
Pitts., Cincinnati & Chicago & St. L.....	1,717	6,616,824	3,328,888	9,945,712	3,328,888	6,616,824	6,616,824	.....	.....	.....	.....
St. Louis & San Francisco.....	4,726	20,251,165	7,681,549	27,932,714	7,681,549	20,251,165	20,251,165	.....	.....	.....	.....
St. Louis Southwestern.....	773	4,976,453	1,024,694	5,999,147	1,024,694	4,976,453	4,976,453	.....	.....	.....	.....
Southern Pacific Co.—Pacific System.....	703	1,397,606	680,101	2,077,707	680,101	1,397,606	1,397,606	.....	.....	.....	.....
Texas & Pacific.....	6,070†	42,754,412	23,624,173	66,378,585	23,624,173	42,754,412	42,754,412	.....	.....	.....	.....
Union Pacific.....	1,884	8,374,112	2,999,801	11,373,913	2,999,801	8,374,112	8,374,112	.....	.....	.....	.....
Vandalia.....	3,411*	28,478,819	8,247,436	36,726,255	8,247,436	28,478,819	28,478,819	.....	.....	.....	.....
Wabash.....	827	4,982,896	1,676,777	6,659,673	1,676,777	4,982,896	4,982,896	.....	.....	.....	.....
Yazoo & Mississippi Valley.....	2,515	14,949,667	5,299,064	20,248,731	5,299,064	14,949,667	14,949,667	.....	.....	.....	.....
Yazoo & Mississippi Valley.....	1,370	5,429,603	1,712,087	7,141,690	1,712,087	5,429,603	5,429,603	.....	.....	.....	.....

*Mileage operated on March 31, 1909, 3,992 miles. †Mileage operated on March 31, 1909, 5,598 miles. ‡Mileage operated on March 31, 1909, 3,310 miles. §Mileage operated on March 31, 1909, 1,327 miles. ||Mileage operated on March 31, 1909, 5,695 miles. ¶Indicates Deficits, Losses and Decreases.

Car Surpluses and Shortages.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association, in presenting statistical bulletin No. 69-A, giving a summary of car shortages and surpluses by groups from December 23, 1908, to April 27, 1910, says:

laneous is due to an accumulation of coke cars in group 3 (Middle). The total shortage is 5,766, a decrease of 1,764, which is accounted for by the box car figures.

"The increase in surplus coal cars is most noticeable through the West and Southwest, while the largest increases in box are in groups 3 (Middle) and 5 (Southern)."

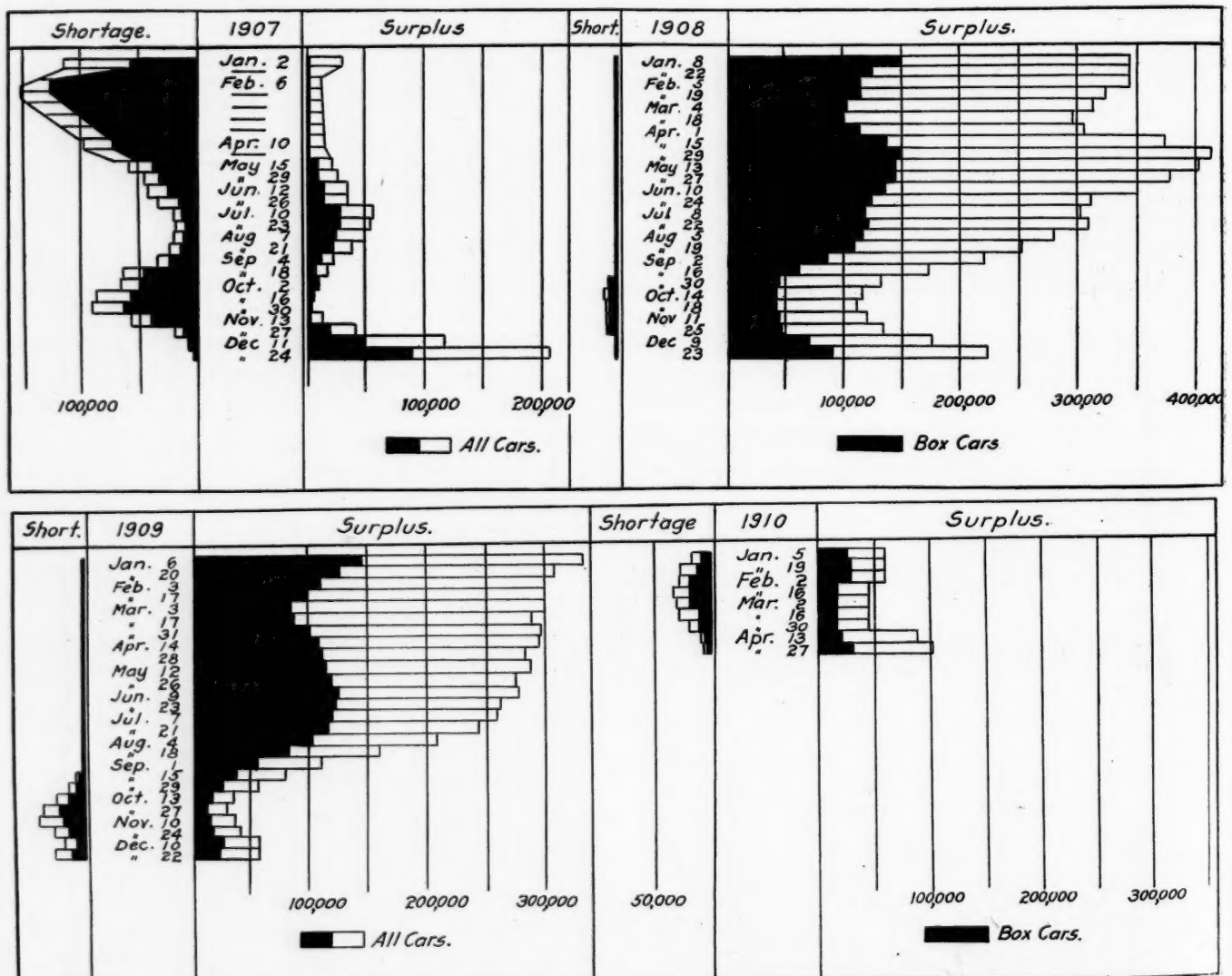
The accompanying table gives surpluses and shortages by

CAR SURPLUSES AND SHORTAGES.										
Group	Date.	Number of roads.	Surpluses.				Shortages			
			Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Box.	Flat.	Coal, gondola and hopper.	Other kinds.
Group 1	April 27, 1910	8	214	483	471	212	84	97	80	10
" 2	" 27, 1910	21	1,264	177	5,474	674	62	15	15	36
" 3	" 27, 1910	23	6,308	2,249	20,309	6,317	75	235	455	479
" 4	" 27, 1910	10	1,266	2	314	869	52	598	850	...
" 5	" 27, 1910	19	3,026	94	2,395	874	121	346	42	509
" 6	" 27, 1910	19	6,720	359	6,080	4,099	535	77	15	233
" 7	" 27, 1910	4	932	124	403	734	...	...	...	...
" 8	" 27, 1910	14	3,019	318	4,519	2,375	...	...	15	4
" 9	" 27, 1910	10	1,287	180	279	912	...	...	...	...
" 10	" 27, 1910	20	4,069	586	4,102	4,728	500	130	5	43
" 11	" 27, 1910	5	1,261	181	45	1,781	349	80	67	52
Total		153	29,366	4,753	44,391	23,575	1,778	1,587	1,544	857
						102,085				5,766

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin, Minnesota and North and South Dakota lines; Group 7—Montana, Wyoming and Nebraska lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Oregon, Idaho, California and Arizona lines; and Group 11—Canadian lines.

"The total surplus is 102,085, an increase of 17,198, about one-half of which is box cars, the remainder being divided between coal and miscellaneous. The increase in miscel-

groups of roads for the last period covered by the report, the chart shows total surpluses and shortages in 1907, 1908, 1909 and 1910.



Car Surpluses and Shortages in 1907, 1908, 1909 and 1910.

Minneapolis and Chicago Grain and Flour Rates.

A conference took place in Chicago last week between officers of the Minneapolis-Chicago lines and representatives of the Chicago Board of Trade regarding grain and flour rates from Minneapolis to Chicago and the East. The Chicago grain and flour interests claim that the rates in question discriminate against them and are seeking a readjustment. They indicate that if their demands are not complied with they will appeal to the Interstate Commerce Commission. The rates regarding which special complaint is made are as follows:

Rates paid by Minneapolis miller:	Domestic.	Export.
Through, Minneapolis to New York.....	25.0	21.5
Flour, Minneapolis to Chicago.....	8.3	7.5
Flour, Chicago to New York.....	16.7	14.0
Rates paid by Chicago miller:		
Through, Minneapolis to New York.....	26.7	24.0
Wheat, Minneapolis to Chicago.....	10.0	10.0
Flour, Chicago to New York.....	16.7	14.0
Differences against Chicago miller.....	1.7	2.5

It is pointed out that this adjustment puts the miller at Chicago at a disadvantage as compared with the miller at Minneapolis on domestic shipments of flour to New York of 1.7 cents per 100 pounds, or 3.4 cents per barrel, and on export flour of $2\frac{1}{2}$ cents per 100 pounds, or 5 cents per barrel; and it is claimed that these differentials disable the miller at Chicago from competing with the miller at Minneapolis.

The Chicago miller also has another ground for complaint. There were inspected at Minneapolis in 1907 11,860,680 bushels of winter wheat and in 1908 18,364,490 bushels. This winter wheat was drawn from Kansas City and Omaha and carried a rate of $19\frac{1}{2}$ cents from Kansas City and $18\frac{1}{2}$ cents from Omaha via Minneapolis to Chicago, with transit privileges at Minneapolis, this through rate being based upon the local rate of 12 cents, Kansas City to Minneapolis, and 11 cents, Omaha to Minneapolis, plus the rate of $7\frac{1}{2}$ cents, Minneapolis to Chicago. The product of this wheat paid the lines from Minneapolis to Chicago $7\frac{1}{2}$ cents per 100 pounds. On the other hand, the rate on wheat, Minneapolis to Chicago, is 10 cents. It is contended that this difference between the rates on flour and on wheat is an unfair discrimination, the Interstate Commerce Commission having held that transportation charges for wheat and flour should be substantially the same.

The Chicago millers contend that they have a right to the same rate on wheat from Minneapolis via Chicago to points in central freight association, or trunk line territories, as is made on flour from Minneapolis to the same destination. To bring about this condition they suggest that the carriers put wheat with milling in transit privileges at Chicago in their through flour tariffs from Minneapolis. It is suggested that the roads make a $7\frac{1}{2}$ -cent rate on wheat from Minneapolis to Chicago, locally, in place of the present 10-cent rate.

The roads have indicated an unwillingness to make the readjustment sought by the Chicago grain and flour interests. It is pointed out that the rate on wheat from the Missouri river to Chicago is the same as it is from the Missouri river to Minneapolis, that is, 12 cents, and that therefore when the Minneapolis miller ships wheat from the Missouri river to Minneapolis, grinds it into flour and ships the flour to Chicago, he has paid a rate of $19\frac{1}{2}$ cents as compared with the 12 cents which the Chicago miller pays from the Missouri river direct to Chicago. It is conceded by the roads that the fact that the flour rate, Minneapolis to Chicago, is lower than the wheat rate gives the Minneapolis miller an advantage, but it is stated that the flour rates are made to meet water competition on the lakes, and that the Chicago miller has an advantage over the Minneapolis miller in the fact that on wheat originating north and west of Minneapolis he gets a through rate, while the Minneapolis miller, who grinds this grain and then ships the flour to Chicago, has to pay the sum of the local rates, and it is pointed out by the roads that if they give the transit privilege asked for at Chicago they at once would be asked to grant a similar privilege at Minneapolis, which would impair their earnings.

It has been suggested that the roads can eliminate the alleged discrimination against Chicago millers by raising the flour rate, Minneapolis to Chicago, to the same basis as the wheat rate; that is, 10 cents, and Chicago interests say this will be satisfactory to them. In reply to the contentions that the flour rate cannot be advanced because it is controlled by water competition, the Chicago milling interests say that the

wheat rate is equally subject to water competition, and that if it can be maintained at 10 cents the flour rate also can be.

Crop Conditions.

The crop reporting board of the department of agriculture estimates that on May 1 the area of winter wheat to be harvested was about 29,044,000 acres, or 714,000 acres (2.5 per cent.) more than the area harvested in 1909, and 4,439,000 acres (13.3 per cent.) less than the area sown last fall (33,483,000 acres). The average condition of winter wheat on May 1 was 82.1, compared with 80.8 on April 1, 83.5 on May 1, 1909, and 86.7, the average for the past ten years, on May 1.

The average condition of rye on May 1 was 91.3, compared with 92.3 on April 1, 88.1 on May 1, 1909, and 89.4, the average for the past ten years on May 1.

Details for winter wheat and rye states follow:

States.	Per cent. abandoned.	Acres remaining to be harvested.	Condition May 1		
			1910.	1909.	10-year av'ge.
Kansas	35.0	4,027,000	65	84	87
Nebraska	28.5	1,978,000	67	83	91
Indiana	5.0	2,627,000	82	77	80
Illinois	7.0	2,139,000	80	78	88
Missouri	17.5	1,821,000	73	82	90
Pennsylvania	2.3	1,556,000	93	88	87
Ohio	4.5	1,944,000	86	70	80
Washington	8.2	676,000	95	93	92
Oklahoma	3.0	1,556,000	87	81	86
Michigan	5.5	869,000	84	82	79
California	5.0	1,088,000	94	81	84
Oregon	6.0	467,000	95	93	96
Maryland	1.1	794,000	93	96	90
Idaho	4.0	345,000	98	93	95
Virginia	2.8	785,000	92	98	90
New York	1.5	444,000	97	85	85
Tennessee	6.5	887,000	83	92	88
Kentucky	6.5	731,000	83	84	88
Montana	15.0	258,000	98	87	..
North Carolina	3.0	652,000	85	92	87
Texas	3.3	1,252,000	91	60	76
West Virginia	3.5	404,000	90	92	86
South Carolina	4.3	453,000	81	89	87
Utah	5.0	155,000	94	93	..
Iowa	28.0	126,000	77	87	90
Colorado	10.0	104,000	94	..	..
Georgia	5.8	268,000	83	93	89
New Jersey	3.0	111,000	96	97	88
Arkansas	3.0	181,000	92	87	87
Delaware	1.8	118,000	98	96	90
Wisconsin	5.0	66,000	92	84	85
Alabama	8.0	123,000	80	91	90
Wyoming	4.8	37,000	94	96	..
Mississippi	5.0	2,000	87	91	86
United States	13.3	29,044,000	82.1	83.5	86.7

Increases in Rates.

The increases in fares on the New York, New Haven & Hartford, noticed last week, include 50-ride family tickets, and on these the advance is in some cases as high as 25 per cent. This appears from the announcement in the bulletin of the New York State Public Service Commission. In abolishing the old style season tickets, good only six days in a week, school commutation tickets are included and, according to the commission's bulletin, pupils of schools will now have to pay 85 per cent. higher fare than heretofore. The commission also figures that on some of the season tickets the increase will be 48 per cent.

The same bulletin announces "advances too numerous to specify" in local round-trip fares on the Harlem division of the New York Central.

The advances in fares on the Boston & Albany in New York State are based on two-mile groups so that, for example, the rate for 35 miles (85 cents) is equal to 2.43 cents a mile.

INTERSTATE COMMERCE COMMISSION.

Shipper Must Load Package Freight.

Utica Traffic Bureau v. New York Central & Hudson River et al. Opinion by Commissioner Clark.

Rule 8B of the official classification provided prior to Jan. 1, 1909, that "the owners will be required to load and unload freight in carloads, except that the carriers reserve the right to load and unload at their expense." On January 1 the words "except the carriers reserve the right to load and unload at their expense" were stricken out and the carriers no longer

furnished tally men and helpers for loading and unloading package freight. Complainant asks that these words be restored to the rules, and the complaint points out that tally men are furnished at New York City, Troy, Rochester and other places. Defendant acknowledged this and said that competitive conditions make it necessary at New York City and other places, and at Troy and Rochester it is done by order of the New York Public Service Commission on intrastate business and, therefore, also done on interstate business. The commission has discussed the subject of loading and unloading package freight very fully in the Wholesale Freight & Produce Association v. A., T. & S. F., 17 I. C. C., 596 case, and following the decision in that case the complaint in the present case is dismissed. (18 I. C. C., 271.)

Reparation Denied.

J. I. Lamb Co. v. Michigan Central et al. Opinion by Commissioner Clark.

Complaint was based on a shipment of grapes from South Haven, Mich., to La Crosse, Wis. (18 I. C. C., 279.)

White Brothers v. Southern Pacific, and four other cases. Opinion by Commissioner Clements.

These cases raise the same question as was considered in *White Brothers v. A., T. & S. F.*, 17 I. C. C., 288, and reparation is denied because of insufficient evidence of unreasonably high through rates. (18 I. C. C., 308.)

Reparation Awarded.

Southern Cotton Oil Co. v. Atlantic Coast Line Railroad et al. Opinion by Commissioner Clark.

Rate on cotton seed hulls from Fayetteville, N. C., to Cartersville, Ga., found unreasonable. (18 I. C. C., 275.)

H. B. Maris v. Southern Pacific et al. and seven other cases. Opinion by Commissioner Clements.

The complaints are of the same character as in the case of *Kindelton v. Southern Pacific*, 17 I. C. C., 251. From the reasons given in that case the charge of 85 cents of defendant for hardwood lumber in carloads from points west of Mississippi to Pacific terminals was found unreasonable, and a rate of 75 cents was established. Reparation is now awarded on certain shipments moving at the time the 85-cent rate was charged. (18 I. C. C., 301.)

Exception to Through Rate Rulings.

Winona Carriage Co. v. Pennsylvania Railroad et al. Opinion by Commissioner Lane.

Complainant made less-than-carload shipments of bar steel over defendants' lines from Johnstown, Pa., via Chicago, to Winona, Minn., for which the rate for through L. C. L. shipments was charged. It appears that a combination rate made up of the L. C. L. rate to Chicago plus the carload rate from Chicago would be less than the through L. C. L. rate. On complaint requesting reparation upon the basis of the combination of the L. C. L. rate and the carload rate; it is held that the case presented does not disclose a typical through rate in excess of the combination of locals such as has been condemned in general terms by the commission. Complaint dismissed. (18 I. C. C., 334.)

Compress Rates Upheld.

Anderson, Clayton & Co. et al. v. Chicago, Rock Island & Pacific et al. Opinion by Commissioner Cockrell.

The complaint alleges that the Traders' Compress Co. imposes certain charges for applying owners' or shippers' patches to cotton bales in their compression and for storage on cotton remaining in the compress at concentration points after the expiration of fifteen days, and that every service performed in connection with the cotton from the point of origin to destination, including the services so charged for by the compress company, are included in the through rate, and an obligation rests on the carriers to protect the owners or shippers against such charges. The facts shown do not justify any order against defendant carriers; the carriers have the

right to compress cotton in transit; they have the right to grant or allow shippers or owners the privilege of concentrating uncompressed cotton at designated compresses on their lines for such treatment as such shippers or owners may desire to give, with the right of such shippers or owners to deliver the cotton back to the carriers for transportation to interstate or foreign destinations at the through rate from points of origin. (18 I. C. C., 340.)

Pacific Coast Switching Cases.

Associated Jobbers of St. Louis v. Atchison, Topeka & Santa Fe et al. Opinion by Commissioner Lane.

Attack is made on the charge of \$2.50 per car made by the defendants for delivering or receiving carload freight to and from industries located on spur or side tracks when the freight is moved incidentally to a line haul. Complaint contends that the charge is illegal, inasmuch as the service for which it is made is an ordinary incident of carriage, and that the charge should be included in the freight rate; and in addition the complaint says that the charge is a discrimination under section 2 of the act to regulate commerce, and that it constitutes an unlawful preference under section 3. Complaint also attacks the rate of \$2.50 per car charged the shipper by the delivering carrier where the shipment is received from a foreign carrier and delivered to the consignee on spur tracks belonging to the delivering carrier. This rate is attacked because the delivering carrier receives in addition to the \$2.50 paid by the shipper, \$7.50 per car paid by the foreign line which turns over the car to the delivering carrier. The charge for delivering cars on spur tracks when this delivery is incident to the line haul is made, so far as is known, only at Los Angeles, San Francisco and San Diego. The spur tracks are within the switching limits of these cities. These industrial spur tracks are not private, in that the carrier may use them for purposes of its own, as for storage of cars, as leads to other industries, and sometimes for public delivery. The charge made for delivery on these tracks is in addition to what would be charged for delivery on the team tracks of the railway. The complainant's view that these tracks are portions of the terminal facilities of the carrier with whose lines they connect, and together with the team tracks and other yards form the terminal facilities of these carriers, is upheld by the majority of the commission.

The American railway rate has always been recognized as covering the full service which the carrier gives in furnishing the car, a proper place at which to load it, the conveyance of that loaded car and its terminal delivery. These various services may be broken up into their component parts and a separate charge made for each, as is done in England, but this is not the American practice. The refinement of the English method in stating rates does not appeal to the mind of the American railway man for the same reason, perhaps, that American hotelkeepers do not make a separate charge to their guests for light and soap.

The theory of the defendant is that in placing the car on a side track it is giving a terminal service in the nature of cartage by rail, ignoring the fact that this so-called cartage antecedes any delivery. The commission is convinced that the placing of a car on an industrial track involves no additional expense over placing the car on a team track. The Supreme Court of the United States in its opinion in the *Union Stock Yards* case holds that a carrier may charge a reasonable rate for a delivery which it cannot make on its own line, and that this rate when separately stated must be judged as to its reasonableness by itself. The commission following this opinion holds that the charge of \$2.50 made by the delivering carrier when the delivering carrier is not one that got the haul of freight before it arrived at the switching limits of the city is reasonable, but the commission condemns as illegal the charge of \$2.50 for delivering or receiving freight on spurs or side tracks within switching limits when such carload freight is moved incidentally to a system line haul.

Commissioner Prouty concurring:

While it costs the railway no more to make delivery on a spur track than on a team track, it is worth more to the shipper to receive his carload freight in this way; but, on

the whole, the shipper by furnishing the track pays all he ought to for the privilege.

Commissioner Harlan also concurring:

My point is that the defendants, in separating the spur track service from the line haul to these three points, Los Angeles, San Francisco and San Diego, and dealing with it as an additional service for which an additional charge may be made, depart from the general practice of carriers and their own practice at other points, and in doing so thereby violate not only section 3 of the act, but section 1 as well. The inequality of the situation is emphasized by the fact that identical rates for all classes of traffic from trunk lines and other defined territory have been extended to some 97 points at or near the Pacific coast, including San Francisco, Los Angeles and San Diego. At all these points, except the three involved, the terminal rates include the movement of cars to and from store door on spur tracks directly connected with the terminals of the defendants.

Chairman Knapp dissenting:

In my opinion the order directed to be entered is unwarranted for two reasons: First, because the charge in question is not unlawful and therefore the commission is without authority to compel its discontinuance; second, because the order is not justified by the facts and circumstances disclosed by the investigation.

Manifestly the exaction of an additional switching charge for private or spur-track delivery cannot be condemned unless such charge violates some provision of the regulating statute. Inasmuch as the charge in controversy is made under definite and proper tariff authority, the commission has no power to require its elimination unless it contravenes one or more of the first three sections of the act.

To hold that this charge violates the first section involves a finding that it is either in and of itself unreasonable, that is to say excessive in amount, or that the aggregate charges for line haul and switching are unreasonable; and there is no evidence to support such a finding. The commission has repeatedly found that terminal rates to Los Angeles and other Pacific coast points are forced down by water competition to a lower basis than the defendants might lawfully exact, and there was really no pretense that the line rate plus the switching rate results in unreasonably high charges for the entire transportation. The real point in controversy is not whether this charge of \$2.50 a car is more than it ought to be, but whether defendants have the right to make any charge whatever, and I do not perceive that the record presents a question of unreasonableness under the first section.

This charge does not violate the second section. It is not within the prohibition against "any special rate, rebate, drawback, or other device," nor can it be said that spur-track delivery to a private industry is "like" service with public team-track delivery. If this section is violated, the defendants are liable to indictment, and a criminal prosecution would be the appropriate proceeding.

Nor does this charge violate the third section, on the showing now made. To say that the team-track consignee, who pays only the line rate, but must incur the expense of cartage from the team track, is given "undue or unreasonable preference or advantage," and that the spur-track consignee, who pays \$2.50 per car more and saves from two to at least four times that amount of cartage, is subjected to "undue or unreasonable prejudice or disadvantage," is so palpably at variance with the conceded facts in this case, and with common experience and observation, as not to admit of serious argument.

The majority report condemns this charge as "illegal and unjust." In my judgment this conclusion is untenable, because the charge is not illegal unless it violates some law which this commission does not administer and under which it can grant no relief. To hold that it is unjust, in view of the undisputed facts, is merely to declare the opinion that although not in contravention of the act it is a charge which in equity and good conscience ought not to be made; and this opinion would seem to rest mainly upon the finding that no extra charge for spur-track delivery appears to be made anywhere in the United States except at Los Angeles, San Francisco and San Diego. In other words, the custom which elsewhere prevails operates in some way to make the charge unlawful at the three places where it is imposed. I am not

aware of any theory by which the obligations of carriers or shippers can be measured by *preponderance of custom*, since it is elementary that the custom which makes law must be continuous and generally observed in the locality where the question of right arises.

Without reviewing the authorities in point it seems clear to me that spur-track delivery is a service which carriers are not bound to perform at common law.

Without attempting to decide whether these industry tracks in Los Angeles are a part of the defendants' terminals or strictly private sidings, there is no question that the service performed for spur-track consignees is a different service from that performed for team-track consignees, and a much more valuable service. (18 I. C. C., 310.)

Pacific Coast Jobbers and Manufacturers Association v. Southern Pacific et al. Opinion by Commissioner Lane.

The Associated Jobbers of Los Angeles v. A., T. & S. F. case followed. (18 I. C. C., 333.)

Ruling on Transit Privilege.

In the matter of the substitution of tonnage at transit points. Opinion by Commissioner Cockrell.

On June 29, 1909, the commission issued its conference ruling No. 76-A, as follows:

76-A. SUBSTITUTING TONNAGE AT TRANSIT POINT (adopted June 29, 1909).—A milling, storage, or cleaning-in-transit privilege cannot be justified on any theory except that the identical commodity or its exact equivalent, or its product, is finally forwarded from the transit point under the application of the through rate from original point of shipment. It is, therefore, not permissible at transit point to forward on transit rate commodity that did not move into transit point on transit rate, or to substitute a commodity originating in one territory for the same or like commodity moving into transit point from another territory, or to make any substitution that would impair the integrity of the through rate. It is not practicable to require that the identity of each carload of grain, lumber, salt, etc., be preserved, but, in the opinion of the commission, it is not possible to lawfully substitute at the transit point any commodity of a different kind from that which has moved into such transit point under a transit rate or rule. That is to say, oats or the products of oats may not be substituted for corn, corn or the products of corn for wheat, nor wheat or the products of wheat for barley, nor may shingles be substituted for lumber, or lumber for shingles, nor may rock salt be substituted for fine salt, nor fine salt for rock salt; likewise oak lumber may not be substituted for maple lumber, nor pine lumber for either oak or maple, nor may hard wheat, soft wheat, or spring wheat be substituted either for the other. These illustrations are given not as covering the entire field of possible abuses, but as indicating the view which the commission will take of such abuses as they arise.

To the end that abuses now existing at transit points may be eliminated, carriers will be expected to conform their transit rules and their billing to the suggestions of this rule. In the event of the failure of any carrier so to do, reductions of legal rates caused by transit abuses will be regarded as voluntary concessions from legal rates.

Following this ruling numerous protests were received from shippers at transit points (particularly from millers at milling-in-transit points) to the effect that it was too strict and that its application would destroy all the benefits of transit privileges. The shippers making these protests petitioned the commission to make an investigation into the matter of substitution of tonnage in transit, and asked that they be permitted to explain their practices and set forth their necessities. In response to these protests and requests the present inquiry was instituted.

One striking fact developed by this inquiry is that the transit privileges have been needlessly multiplied by the carriers. The interest which prompts this needless extension of the privilege is apparent. A carrier bringing raw material to a competitive transit point desires always to make certain that the product of such raw material shall go forward by its line. The

most evident method of securing this result is to collect something more than the net rate for the transportation of the raw material to the transit point upon delivering such raw material to the industry, the excess collection to be credited upon the rate for the forwarding of the finished product from such point. In such cases it is evident that the industry must pay a penalty if it uses any other means of transporting the finished product than the one provided by the carrier which transported the raw material. An analysis of the transit tariffs filed with us shows that the arrangement is in many cases not a privilege at all, but a burden upon the industries to which it applies. Such an arrangement frequently amounts to a requirement by the carrier that the industry shall in advance put up a bond that the finished product shall be forwarded by such carrier's line.

This competitive policy of the carriers, which results in many unnecessary transit arrangements, has also resulted in many pretended transit arrangements which cannot be justified as such. We have before us, for instance, tariffs which provide for the forwarding of agricultural implements, vehicles, etc., as the transit of inbound shipments of logs. Unless all tariffs are to become "transit tariffs," such arrangements as those last mentioned must be condemned as unlawful. An agricultural implement is bound to be largely composed of other materials than wood, and may be entirely composed of such other materials. It is a manufactured product, having its first being at the factory where it is made. Its shipment from the factory is not in any proper sense a continuation of the shipment of the log from the forest to the mill.

In Conclusion.—The hearing has failed to demonstrate that the commission's ruling was too strict. It has demonstrated that various practices, as above outlined, have resulted in the violation of published rates, to the injury of shippers not taking advantage of such practices. Fraud cannot be defined in this matter of abuse of transit any more than in any other line of activity. The commission will not undertake to frame a code of transit rules. The traffic officials of the carriers have the duty and the responsibility under the law of initiating rates. They all agree in the statement that the system of rates devised by them is impracticable, and will result in great injury to carriers and business interests unless exceptions and privileges in the nature of transit are introduced. The commission does not condemn the transit privileges as such, but it does hold that the responsibility for safeguarding and policing them, to the end that the lawfully published rates shall be collected, rests entirely upon the carriers. This is not saying that shippers will be excused in any case where they defeat published rates by any abuse of transit privileges. The duty of shippers to pay published rates is precisely the same as the duty of the carriers to collect such rates. Except in very rare instances, carriers give rebates or concessions only upon solicitation by shippers. In such case the liability of the carrier yielding to the solicitation is no greater or different than that of the shipper making it.

It is the duty of shippers to submit to all necessary policing of their shipments if they desire to enjoy transit privileges. They may also fairly be required to certify that shipments offered by them are entitled to go forward upon the transit rates. Such certifications, however, do not excuse carriers from determining for themselves and at their peril that shipments carried at other than the regular local rates from the point of shipment are entitled to the exceptional or transit rates. Carriers will not be allowed to put in transit privileges either through competition with each other, or through the desire to hold local rates up to the highest possible point, without taking entire responsibility for the results of such privileges and the uses made of the same.

The commission is convinced that if the carriers will join in the cancellation of the arrangements which they have built up for the purpose of withholding business from each other they will be relatively as well off as they are now, while the elimination of these arrangements will decrease their expense of bookkeeping and supervision and will be for the benefit of all the industries affected. The commission is also convinced that if carriers will yield somewhat in the matter of local rates to and from transit points, it will be possible to make such rates equal to the present published transit rates in many cases without serious loss of income to the carriers and to their final profit. In every case where it is pos-

sible to replace transit privileges with flat rates it should be done.

At none of the large warehousing markets are the difficulties in the way of the adoption of a flat-rate system any greater than were those presented at Missouri River points some years ago when the commission condemned the unlawful arrangement of rates on grain. As a result of the commission's action the full local rates upon grain to these points are now paid regardless of the final disposition of such grain. Outbound shipments of grain from these points are carried at a flat rate regardless of the point of origin, providing the grain be "from beyond." While still open to some legal objection, the system is far in advance of the system which it succeeded, and is so much in advance of the transit privileges generally throughout the country that it may well be accepted as a model by traffic managers desirous of remedying chaotic and unlawful practices upon their lines. The commission is convinced that in no other way can transit rates to and from the large storage markets be arranged unless carriers are to take an impossible burden of policing and supervision and shippers be subjected to extremely annoying rules.

The commission has been asked by numerous shippers, including the grain dealers along the Ohio river, the grain dealers in inter-mountain territory, and the lumber and shingle manufacturers of the Pacific coast, to condemn the transit privilege entirely as illegal. This the commission is not prepared to do, the present order of the investigation affording no warrant for such action.

It is the law which has binding force upon both shippers and carriers in this matter, rather than rulings of the commission, which simply represent the commission's view of the law. The commission's duty is to enforce the law, and this duty it is determined to perform. Ruling 76-A of the commission, *supra*, may be taken, together with this opinion, as indicating the commission's knowledge of the abuses shown by this investigation, and its demand upon both carriers and shippers that these and all similar abuses be prevented. If the abuses are prevented the law will be satisfied. If the abuses are not prevented the law will not be satisfied, no matter how ingeniously the machinery provided obscures the fact that the law is evaded.

We are convinced that shippers and carriers fully understand the commission's position and their own practices. It is needless to say that the continuance of such abuses as are above outlined will compel the commission to resort to criminal prosecution, to include both shippers and carriers, to secure obedience to the law rather than to any further or other form of moral suasion. (18 I. C. C., 280.)

STATE COMMISSIONS.

W. A. Bowden has been appointed chief engineer of the Department of Railways and Canals of Canada. Mr. Bowden has been designing engineer of the department for the last five years.

Louisiana: New Orleans Interests Upheld.

New Orleans Board of Trade v. Louisiana & Arkansas Railway et al.

The petition in this case asks that the commission establish the same scale of rates from New Orleans to Minden as are carried from New Orleans to Sibley.

Minden is a station on the Louisiana & Arkansas five miles north of Sibley, and is the junction point of the Vicksburg, Shreveport & Pacific with the Louisiana & Arkansas. There is no line competing with the Louisiana & Arkansas at Minden.

The rates to Sibley from New Orleans are lower than the rates from New Orleans to Minden, Sibley being an intermediate point. This condition is brought about by the competition of the Vicksburg, Shreveport & Pacific, but does not seem to be justified by the existing conditions. New Orleans competes with St. Louis and Memphis on through business at Minden. The interstate rates from St. Louis to Minden and Sibley are higher than the rates from St. Louis to Shreveport, Shreveport being a jobbing point, selling largely to

Minden and the surrounding territory. Under the present adjustment of rates Memphis has a differential in rates to Minden on certain classes. It was also shown by the evidence submitted that on a number of commodities the rate is lower from Memphis and St. Louis to Minden than the rate from New Orleans. The short line distance from New Orleans to Minden is 299 miles, the distance from Memphis to Minden is 327 miles, and the distance from St. Louis to Minden is 540 miles.

Rates from New Orleans are ordered reduced to Minden to basis of Sibley rates.

The New Orleans Board of Trade v. Gulf, Colorado & Santa Fe et al.

The plaintiffs in this case ask that certain reductions in rates be made between New Orleans and stations on the Gulf, Colorado & Santa Fe Railway west of Oakdale. In seeking to sell its commodities along this line of railway New Orleans comes into direct competition with Houston and Galveston, from which lower rates are in force.

On this point the commission will say that the principle of establishing rates in order to meet legitimate competition, whether that competition be all rail, or all water, or part rail and part water, or interstate, or between points in the same state, is so well settled as to need no defense when the conditions under which the traffic is handled over two competing lines are substantially the same.

New Orleans, the great metropolis of the South, is not entitled to any preferential rates, but it is entitled to receive fair and reasonable rates to any territory in the state of Louisiana, as well as to points in other states where it competes with cities of like importance.

There has been no evidence introduced in this case by the defendant to show that the rates proposed by the New Orleans Board of Trade are not reasonable in themselves, and the comparisons submitted show that there are rates in effect to points as far distant from New Orleans as points on the Gulf, Colorado & Santa Fe Railway which are as low, and in some cases lower, than the rates proposed by the plaintiffs in this case. These proposed rates are therefore ordered to be put in effect.

Louisiana: Baton Rouge Interests Upheld.

The Baton Rouge Board of Trade v. the New Orleans, Texas & Mexico.

The Baton Rouge Board of Trade asks that the rates on classes and commodities from Baton Rouge to points on the New Orleans, Texas & Mexico as far as Eunice, La., be reduced 33 1/3 per cent. below the rates from New Orleans to that territory, Baton Rouge being approximately 80 miles nearer this station than is New Orleans. The commission believes that the demand of plaintiffs, if granted in its entirety, would place the local jobbers of Eunice, Crowley, Opelousas and Lafayette and Lake Charles at a disadvantage and would create an unjust discrimination against them, therefore a reduction of 20 per cent. in rates is ordered.

The Baton Rouge Board of Trade v. Yazoo & Mississippi Valley; Illinois Central and the New Orleans Board of Trade, intervenors.

The Baton Rouge Board of Trade filed with the commission a petition asking that the freight rates on classes and commodities between Baton Rouge and Hammond be made the same as rates on similar commodities from New Orleans to Hammond. The Yazoo & Mississippi Valley denies the reasonableness of this request, and in order to meet the allegations of the complaint, that the present adjustment creates an unjust discrimination against Baton Rouge by allowing the jobbers of New Orleans, with whom it competes, more favorable freight rates, the Illinois Central, under the same management as the Yazoo & Mississippi Valley, filed a request with the commission asking that it be permitted to advance its rates from New Orleans to Hammond. The New Orleans Board of Trade objects to this advance in rates.

Many years ago the Illinois Central put in a lower scale of rates between New Orleans and Hammond than apply at intermediate points in order to meet the competitive rates of water craft which operate between New Orleans and Wadesboro, a landing on the Natalbany river a few miles southwest of

Hammond. The Illinois Central has, however, never complained that these rates are unreasonable or not justified by the competitive conditions until this case arose. When the Baton Rouge & Hammond division of the Yazoo & Mississippi Valley began operating, rates were established between Baton Rouge and its stations without making any reductions at Hammond to meet the low rates already in effect from New Orleans.

The commission believes that if the Yazoo & Mississippi Valley was under a different and distinct management from the Illinois Central the Baton Rouge shippers would not have to come before it in order to secure the adjustment asked for, since two cities, situated as are Baton Rouge and New Orleans, both competing for business at a junction point, would be afforded equal rates, although actual water competition might exist from one of the cities and not from the other. The request of the Illinois Central for permission to advance its rates between New Orleans and Hammond is denied and the Yazoo & Mississippi Valley is required to comply with the demands of plaintiffs.

COURT NEWS.

The United States Circuit Court of Appeals, in an opinion by Judge Noyes, has affirmed the decision of the lower court, imposing a fine of \$20,000 on the Standard Oil Co. for accepting illegal rebates on oil shipped from Olean, N. Y., over the Pennsylvania, the New York Central and the Rutland, to points in Vermont.

The Indiana Railroad Commission has secured an important decision in connection with the enforcement of its orders. Judge Anderson, of the Federal court, and Judge Remster, of the Indianapolis circuit court, have ruled that railway companies must immediately begin to obey the orders of the railway commission after the lower courts have affirmed such orders, and that the railway companies must put the orders in operation pending appeals to the higher courts. In some cases the orders of the commission have been nullified by appeals that have remained undecided for two years or more.

Judge Chas. Remster, of the Indiana circuit court at Indianapolis, has rendered a decision holding that when the Railway Commission of Indiana issues an order to a railway, and the railway appeals from it to a court, and the court upholds the commission, the order of the commission at once becomes effective and the railway must obey it, pending appeal to a higher court. In May, 1909, the commission fixed switching rates which the Chicago, Indianapolis & Louisville was required to apply at Bloomington, Ind. Judge McMasters, of the Marion county superior court, upheld the commission. In another case the commission issued an order fixing rates on coal and other commodities from New Albany, Ind., to points in the northern part of the state. The road appealed from the commission's order to the federal court, which also upheld the commission. Judge Remster ruled that the road must obey both these orders pending appeals. Heretofore the roads in Indiana have refused to obey orders of the commission which they litigated until they had been upheld by the highest court to which appeal was made.

The supreme court of New York, Appellate division, Third department, has decided in favor of the Public Service Commission, Second district, in the suit of the commission to require the New York Central to secure the approval of the commission before issuing equipment trust certificates. In the issuance of such certificates to the amount of \$30,000,000 the company contended that such certificates were not obligations of the railway company, like stocks and bonds, inasmuch as they were issued by the Guaranty Trust Co., and not by the railway company. The decision holds that such certificates come within the terms of section 55 of the Public Service Commission's law. The New York Central having issued certificates as above in 1907, without the consent of the commission, argued that the certificates were simply contract obligations between the railway company and the issuing trust company. The court, however, holds that no company is liable to pay equipment trust certificates but the railway company itself, and that the railway must not accomplish by indirection what it has been forbidden by the statute to do directly.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

H. W. Seaman has been elected president of the Manistee & Grand Rapids.

A. P. Tugwell has been appointed treasurer of the Tremont & Gulf, with office at Winnfield, La., succeeding N. D. Patterson, resigned.

N. P. Ramsey has been appointed vice-president and general manager of the Ashland & Western, succeeding W. D. Holliday, whose resignation has been announced in these columns.

H. B. Voorhees, superintendent of the Philadelphia division, and general agent of the Baltimore & Ohio at Philadelphia, Pa., has been appointed an assistant to the president, with office at Baltimore, Md.

The office of C. B. Seger, general auditor of the Southern Pacific, Union Pacific, Oregon Short Line, Oregon Railroad & Navigation Co. and the Pacific Mail Steamship Co., has been transferred from Omaha, Neb., to Chicago.

W. F. Dickinson has been appointed general attorney of the Rock Island lines, with office at Chicago. He will have charge of all litigation and questions arising under federal statutory laws, and will perform such other duties as may be assigned to him.

Hale Holden, whose appointment as assistant to the president of the Chicago, Burlington & Quincy Railroad Company, with office at Chicago, has been announced in our issue of March 4, page 458, was born August 11, 1869, at Kansas City, Mo. Mr. Holden graduated from Williams College in 1890, and from the Harvard Law School in 1893. Since July 1, 1907, he has been with the Chicago, Burlington & Quincy as general attorney, with office at Chicago, until February 21, 1910, when he was promoted to his present position, as assistant to the president.

The officers of the Norfolk Southern, formerly the Norfolk & Southern, are as follows: E. T. Lamb, president; Frederick Hoff, vice-president; Chadbourne & Shores, general counsel; Matthias Manly, treasurer; Morris S. Hawkins, secretary, and Nelson W. Runnion, assistant secretary, all with offices at Norfolk, Va.

E. K. Boisot has been elected president of the Illinois Southern, with office at Chicago, succeeding J. W. Walsh, who has been elected vice-president. A. F. Williams has been appointed auditor, and F. O. Wetmore has been appointed treasurer, all with offices at St. Louis, Mo. W. T. Abbott, general attorney, has been appointed general counsel, with office at Chicago.

The organization of the accounting department of the Chicago, St. Paul, Minneapolis & Omaha, under the immediate supervision of Charles Jensch, general auditor at St. Paul, Minn., is as follows: J. H. Gordon, auditor freight accounts; J. P. Plunkett, auditor disbursement accounts; F. E. Beatty,

auditor passenger accounts, and F. V. Caesar, auditor freight overcharge claims.

Charles D. Brandriff, whose appointment as general auditor of the Chicago & North Western, with office at Chicago, has been announced in these columns, was born at Millville, N. J., February 18, 1874. He graduated from the Missouri Valley High School in 1891 and from the University of Michigan in 1897. He entered railway work as a clerk in the Missouri Valley, Iowa, storehouse of the Chicago & North Western in November, 1897, and was later transferred to a similar position in the Chicago storehouse. In February, 1900, he was made assistant general bookkeeper in the office of the vice-president in charge of accounts, and in January, 1903, he was promoted to general bookkeeper, the position he leaves to become general auditor.

Operating Officers.

Henry J. Horn has been appointed assistant general manager of the Chicago, Burlington & Quincy, with office at Omaha, Neb.

R. S. Serbyshire has been appointed superintendent of the Central Ontario, with office at Irondale, Ont., succeeding G. A. Hoag.

Mott Sawyer has been appointed superintendent of the Bellingham Bay & British Columbia, with office at Bellingham, Wash.

G. W. Hamilton has been appointed chief despatcher of the Third and Fourth districts of the Western Pacific, with headquarters at Portola, Cal.

Charles W. King, assistant superintendent of the Utah lines of the Denver & Rio Grande at Salt Lake City, Utah, has resigned, and the office has been abolished.

M. B. Murphy has been appointed a trainmaster of the Canadian Northern, with office at Winnipeg, Man., in charge of the eastern section of the Second division.

Edward W. Duval, assistant to the general manager of the Canadian Pacific at Winnipeg, Man., has been appointed superintendent of terminals, with office at Calgary, Alb.

N. J. Hudson has been appointed transportation inspector of the Los Angeles division of the Atchison, Topeka & Santa Fe, with office at Los Angeles, Cal., succeeding A. F. Hunt, assigned to other duties.

J. C. Wood has been appointed general agent, operating department, of the Chicago, Milwaukee & St. Paul, with office at Pittsburgh, Pa., succeeding J. H. Skillen, assigned to other duties, as previously announced in these columns.

W. W. Rider, general superintendent of telegraph of the Cleveland, Cincinnati, Chicago & St. Louis and other New York Central lines, has had his authority extended over the Toledo & Ohio Central and the Zanesville & Western, with office at Chicago.

W. B. Hyde, chief clerk in the freight department of the Baltimore & Ohio, at Pittsburgh, Pa., has been appointed inspector of station service, with office at Pittsburgh, and Alvah E. Day, of the transportation department, at Baltimore, Md., has been appointed inspector of station service on the main line system.

The position of trainmaster at Springfield, Mass., of the Boston & Albany, in charge of the examination on train rules, vision, color, sense and hearing, has been abolished, and S. C. Bostwick has been appointed examiner, with office at Springfield, in charge of examination on vision, color, sense and hearing. Examinations on train rules will be conducted by the trainmasters in their respective districts.

Thomas Brennan, assistant superintendent and superintendent of telegraph of the Chicago, Indiana & Southern at Gibson, Ind., has been appointed assistant superintendent at Danville, Ill. W. L. Connelly, trainmaster at Danville, has been appointed superintendent of telegraph at Gibson, the office of



Hale Holden.

trainmaster having been abolished. These changes were reported erroneously in these columns April 8, page 966.

H. R. Laughlin, who has been appointed superintendent of the Monongah division of the Baltimore & Ohio, succeeding U. B. Williams, began railway work in February, 1884, as a telegrapher at Oakland, Md. He was then appointed train despatcher of the Cumberland division of the Baltimore & Ohio, at Grafton, W. Va., and in July, 1900, was made chief despatcher of the Wheeling division. In October, 1902, he was appointed a trainmaster at Wheeling, W. Va., and the following January was transferred to the Monongah division, which position he held at the time of his recent appointment as superintendent of the Monongah division.

Joseph Donahue, whose appointment as superintendent of the Illinois division of the Baltimore & Ohio Southwestern, with office at Flora, Ill., has been announced in these columns, was born at Mitchell, Ind., March 28, 1868. He received a high school education and entered railway work in May, 1884, as clerk to the roadmaster of the Ohio & Mississippi, now a part of the B. & O. S. W. He learned telegraphy while holding this position and in 1886 was made night operator at Medora, Ind. He held various positions as operator until 1894, when he was made despatcher on the Louisville district. In 1905 he was promoted to night chief despatcher at Washington, Ind. He was appointed trainmaster of the Springfield division in 1907 and trainmaster of the Indiana division the same year, the position he held until his recent promotion.

C. B. Gorsuch, whose appointment as superintendent of the Wheeling division of the Baltimore & Ohio, with office at Wheeling, W. Va., has been announced in these columns, entered the service of the Baltimore & Ohio in June, 1886, as a telegraph operator on the Pittsburgh division at Summit Point, Pa. About four years later he was appointed clerk in the office of the division operator, remaining in that position until June, 1893, when he was promoted to chief train despatcher. He was made division despatcher in September, 1899, and was promoted to trainmaster of the Pittsburgh division May 1, 1902, which position he held at the time of his recent appointment as superintendent of the Wheeling division.



C. B. Gorsuch

James Paul Stevens, whose appointment as general superintendent of the Kentucky lines of the Chesapeake & Ohio, with office at Covington, Ky., has been announced in these columns, was born December 25, 1885, at Peru, Ind. Mr. Stevens was educated in the common schools and began railway work in January, 1900, with the Chesapeake & Ohio as operator, copier and despatcher on the Richmond division. In January, 1904, he was appointed assistant trainmaster on the Cincinnati division, and three months later was made chief despatcher on the same division. He remained in this position until February, 1907, when he was appointed assistant superintendent of the Cincinnati division, which position he held until the following January. In September, 1908, he was appointed superintendent of the Cincinnati division, with office at Covington, Ky., remaining in this position until his recent appointment as general superintendent of the Kentucky general division.

U. B. Williams, who has been appointed general superintendent of the Wheeling system of the Baltimore & Ohio

succeeding W. C. Loree, began railway work in November, 1871, as a telegraph operator on the Baltimore & Ohio, at Cameron, W. Va. He was appointed a train despatcher June 1, 1875, at Fairmont, W. Va., and three years later was made agent and operator at Cameron, becoming train despatcher at that place in December, 1880. He was appointed chief despatcher of the Monongah division in January, 1884, with office at Grafton, and in November, 1886, was made trainmaster on the same division, from which position he was promoted to superintendent of the Wheeling division in November, 1901. Mr. Williams was appointed superintendent of the Monongah division in April, 1903, which position he held at the time of his recent appointment as general superintendent of the Wheeling system.

Traffic Officers.

J. L. Jackson has been appointed immigration agent of the Central of Georgia, with office at Savannah, Ga.

Ross Brown has been appointed a district passenger agent of the Iowa Central, with office at Oskaloosa, Iowa.

W. A. Ward has been appointed general freight and passenger agent of the Central Ontario, with office at Irondale, Ont.

W. B. McConnico has been appointed a contracting freight agent of the Yazoo & Mississippi Valley, with office at Baton Rouge, La.

William B. Johnson has been appointed agent of the Southern Pacific at Baltimore, Md., succeeding Benjamin R. Barber, deceased.

E. A. Turner has been appointed commercial agent of the International & Great Northern at Dallas, Tex., succeeding George Simpson, resigned.

H. W. Hoey has been appointed general agent of the Hocking Valley at Cincinnati, Ohio, succeeding H. E. Thatcher, transferred to Toledo, Ohio.

W. A. Horne has been appointed general freight and passenger agent of the Tombigbee Valley, with office at Mobile, Ala., succeeding A. V. B. Gilbert.

J. C. Havely has been appointed district freight and passenger agent of the Western Pacific and the Denver & Rio Grande, with office at Sacramento, Cal.

A. J. Rich has been appointed a soliciting freight agent of the Nashville, Chattanooga & St. Louis, with office at St. Louis, Mo., succeeding J. V. McCarty, promoted.

Paul F. Bonorden has been appointed city passenger and ticket agent of the Chicago Great Western at Omaha, Neb., succeeding Marshall Craig, resigned to accept service with another company.

R. M. McWilliams has been appointed a commercial freight agent for the Missouri Pacific-Iron Mountain System, with office at Cairo, Ill., succeeding C. H. Ogilvie, transferred, as previously announced in these columns.

J. C. Hammond, agent of the Wabash Railroad at Alton, Ill., has been appointed a commercial agent, with office at Alton, in charge of freight and passenger business, succeeding J. B. Hayes, transferred to East St. Louis.

Arthur C. Irons, chief clerk in the general passenger department of the Chicago Great Western, has been appointed assistant general passenger agent, with office at Chicago, succeeding R. F. Malone, resigned to go into other business.

A. J. Dutcher, traveling freight agent of the Union Pacific and the Southern Pacific, with headquarters at Chicago, has been appointed general agent of the freight and passenger departments at Atlanta, Ga., vice J. F. Van Rensselaer, resigned.

William Humphreys, traveling freight agent of the Southern Railway at Cincinnati, Ohio, has been appointed soliciting freight agent at Louisville, Ky. J. L. Martin, traveling freight agent of the Queen & Crescent, at Atlanta, Ga., succeeds Mr. Humphreys.

Stephen Y. Baldwin, commercial freight agent of the Dela-

ware & Hudson, at Pittsburgh, Pa., has been appointed a general agent, freight department, with office at Albany, N. Y., and James Fitzsimmons has been appointed general agent, freight department, with office at Chicago.

J. H. Dengel, contracting freight agent of the Chicago Great Western at Kansas City, Mo., has been appointed commercial agent, succeeding C. L. Hoga, whose resignation has been announced in these columns. W. M. Hogue, soliciting agent, succeeds Mr. Dengel; and H. Miller, chief clerk, succeeds Mr. Hogue.

T. M. Schumacher, vice-president of the Denver & Rio Grande and the Western Pacific, has been appointed assistant traffic director of the Harriman lines, with office at Chicago, succeeding E. O. McCormick, whose appointment as vice-president of the Southern Pacific has been announced in these columns.

James C. Ferguson, general agent, freight and passenger departments of the Union Pacific, with office at Denver, Colo., has been transferred to Detroit, Mich., succeeding Francis B. Choate, general agent freight and passenger departments at Detroit, and Mr. Choate succeeds Mr. Ferguson at Denver.

E. J. O'Hayer, Jr., chief clerk to the passenger traffic manager of the New York Central lines west of Buffalo, N. Y., with office in Chicago, has been appointed general eastern passenger agent of the New York Central lines at New York, succeeding to the duties of L. F. Vosburg, assistant general passenger agent.

T. O. Jennings, general agent of the Frisco lines at Chicago, has been appointed assistant general freight agent. E. S. Stephens, freight claim agent, succeeds Mr. Jennings. B. H. Stanage has been appointed assistant general freight agent at Chicago, his duties to include those previously performed by Mr. Stephens.

Engineering and Rolling Stock Officers.

W. D. Hodge has been appointed chief engineer of the Denver, Laramie & Northwestern, with office at Denver, Colo., succeeding E. A. Buck.

G. H. Cravens has been appointed chief engineer of the Memphis, Paris & Gulf, with office at Nashville, Ark., succeeding H. C. McCluer.

F. M. Whyte, general mechanical engineer of the New York Central Lines, has resigned to go to the New York Air Brake Co., New York, effective June 1.

The office of S. P. Hull, engineer maintenance of signals of the New York Central & Hudson River, has been transferred from New York City to Albany, N. Y.

J. Drinkwater, district roadmaster of the Temiskaming & Northern Ontario at Englehart, Ont., has been promoted to inspector of work and forces in the road department, with jurisdiction over all lines.

W. F. Plate, division roadmaster of the Gulf, Colorado & Santa Fe, at Temple, Tex., has resigned. Samuel Lincoln, division roadmaster at Conroe, Tex., has been transferred to Temple, succeeding Mr. Plate.

C. M. Hoffman, master mechanic of the Denver & Rio Grande at Grand Junction, Colo., has been appointed assistant superintendent of the Idaho division of the Oregon Short Line, in charge of motive power, with headquarters at Pocatello, Idaho, vice A. H. Gairns, resigned.

E. O. Faulkner, manager of the tie and timber department of the Atchison, Topeka & Santa Fe, has had his jurisdiction extended over the timber lands owned by the company. George E. Rex, who has served as Mr. Faulkner's assistant, has been appointed manager of tie treating plants.

W. F. Kaderly, master mechanic of the Southern Railway, has been appointed superintendent of motive power of the Georgia, Southern & Florida, with office at Macon, Ga. L. B. Rhodes, master mechanic, having resigned, that position is abolished, and all employees heretofore reporting to Mr.

Rhodes will in future report to the superintendent of motive power.

E. C. Sasser, master mechanic of the Southern Railway at Alexandria, Va., has been appointed master mechanic at Spencer, N. C., succeeding W. F. Kaderly, resigned to go to another company. C. H. Kadie, master mechanic at Charleston, S. C., succeeds Mr. Sasser, with office at Alexandria, and W. B. Lipscomb, foreman locomotive repairs at Selma, Ala., has been appointed master mechanic at Charleston, succeeding Mr. Kadie, transferred.

R. N. Begien, whose appointment as assistant to the chief engineer of the Baltimore & Ohio, with office at Baltimore, Md., has been announced in these columns, was educated at the engineering school of Harvard University and was a member of the class of 1897. Mr. Begien was a member of the Nicaragua Canal Commission, in Central America, for three and a half years, resigning that position to go to South America to become a railway engineer in Ecuador. The following year he returned to the United States and took a position in the engineering department of the District of Columbia. He was appointed assistant engineer of the Baltimore & Ohio in August, 1902, at Somerset, Pa., and was made division engineer of the Philadelphia division in June, 1908, which position he held at the time of his recent appointment as assistant to the chief engineer.

Lewis W. Baldwin, whose appointment as engineer maintenance of way of the Illinois Central, with office at Chicago, has been announced in these columns, was born in Waterbury, Md. He graduated in civil engineering at Lehigh University with the class of 1896, and entered the engineering department of the Illinois Central at once. He was appointed track supervisor of the Illinois Central in 1900, roadmaster of the Yazoo & Mississippi Valley in 1901, roadmaster of the Illinois Central in 1902, and was promoted to trainmaster in 1904. He was transferred to a similar position on the Indianapolis Southern in 1905, promoted to superintendent of that road in 1906, and made trainmaster of both the Illinois Central and the Indianapolis Southern in 1908. In November, 1908, he was appointed superintendent of the Yazoo & Mississippi Valley, the position he held until his recent promotion.

John T. Wilson, whose appointment as district engineer of the Baltimore & Ohio, with jurisdiction over the territory between Philadelphia, Pa., and the Ohio river at Parkersburg, W. Va., and Wheeling, with office at Baltimore, Md., has been announced in these columns, was educated at the Massachusetts Institute of Technology and began railway work as a rodman in 1886 on the Pittsburgh & Lake Erie. About two years later he went to the engineering department of the Pennsylvania Railroad as a transitman, and was then appointed draftsman and later promoted to assistant engineer. He was appointed resident engineer of the Pittsburgh & Western, now part of the Baltimore & Ohio, in December, 1897, and subsequently became engineer maintenance of way. In August, 1902, he was appointed resident engineer of the Baltimore & Ohio at Wheeling, W. Va., and division engineer two years later. In August, 1905, he was made assistant engineer, with office at Baltimore, Md., and while in that position was engaged in the work of rebuilding the old main line between Relay Station, Md., and Washington Junction. The large classification freight yard at Brunswick, Md., was built under his direction, as well as the double-track steel bridge over the Susquehanna river, which was opened in January of this year.

OBITUARY.

William J. Post auditor of the Bessemer & Lake Erie and the Union Railroad, died May 8, at his home in Pittsburgh, Pa., at the age of 49 years.

John I. Kinsey, who died April 28 at Easton, Pa., at the age of 83 years, was master mechanic on the Lehigh Valley Railroad for over 40 years. He entered the service in 1856 at the South Easton, Pa., shops. In 1897 he was appointed superintendent of machinery of the Morris Canal. Mr. Kinsey was an honorary member of the American Railway Master Mechanics' Association since 1868.

Railway Construction.

New Incorporations, Surveys, Etc.

ALBERTA MIDLAND.—See Canadian Northern.

ASTORIA SOUTHERN.—Incorporated in Oregon with \$500,000 capital, to build from Young's bay, Ore., at Astoria, to points on Nehalem bay and to points in Tallamook county. Right-of-way is said to have been secured and it is understood that work will be started soon. The incorporators include: L. W. Humphreys, W. E. Thomas and O. J. Kraemer, all of Portland.

ATLANTIC COAST LINE.—Plans have been made to extend the double-track system from Savannah, Ga., to Jesup, and this work will be started soon. Tentative plans are being made for eventually extending the double track to Jacksonville, Fla.

ATLANTIC, QUEBEC & WESTERN.—The New Canada Co. was organized some time ago to build an extension of this road from Port Daniel, Que., northeast to Gasby. It is expected that the line will be opened for traffic by July as far as Grand river, 30 miles from Port Daniel, leaving about 50 miles yet to be built to complete the line to Gasby. Work has been finished from Port Daniel on a section of 20 miles, which was constructed through solid rock, and included piercing a 600-ft. tunnel. At Gasby Landing there is a depth of 40 ft. of water and a pier, 300 ft. long, is to be built at a cost of \$300,000. It is the intention to make this place an ocean port. Trains are now in operation from New Carlisle northeast to Port Daniel, 22.3 miles. (Dec. 3, p. 1106.)

BOSTON & ALBANY.—An officer writes that the company intends to carry out improvements during 1910 to cost about \$2,000,000. A contract has already been let for the new station at Worcester, Mass., and work on the elimination of crossings cannot be started for some time, as this is dependent upon the work which the New York, New Haven & Hartford is to carry out. The work at East Cambridge, Mass., Natick, South Framingham and Westfield is practically all track work, which will be done by the company's men. Contracts have been let to the American Bridge Co. for the steel work for bridge renewals. Plans for third-tracking between Greenbush, N. Y., and Rensselaer will probably be ready to ask for bids for the work in about two weeks, and about the same time bids will probably be asked for the tunnel work at State Line. The larger part of this work will be handled by the company's men, with the exception of the third-tracking and tunnel work. (May 6, p. 1183.)

BOSTON & MAINE.—Announcement is said to be made that the Boston & Maine will make Salem, Mass., an important freight center, and plans are under way for extensive improvements at that place. The work will include the removal of grade crossings and revision work in the tunnel, to provide two tracks in place of the existing single track. (Jan. 21, p. 164.)

CANADIAN NORTHERN.—Engineers have been at work for several months locating a new route for an extension from Port Arthur, Ont., east to Sudbury. The new line will cross the divide between Port Arthur and Nipigon at an elevation of 220 ft. lower than it is now crossed by the Canadian Pacific; this means that a 0.4 per cent. grade has been secured.

An officer is quoted as saying that an extension will be built this coming summer from Edmonton, Alb., west into the Brazeau coal fields in the foot hills of the Rocky mountains. The charter of the Alberta Midland Railway covering this route is said to have been secured and the line is to be subsidized by the government.

CANADIAN PACIFIC.—The Canadian Pacific has filed plans for a new entrance and underground line through the city of Ottawa, Ont. The company proposes to secure from the Dominion government a section of the Rideau canal, which it proposes to drain and use for a roadbed for the new line, also to pierce an underground tunnel from near the post-office to Wellington street, thence under Wellington street to the surface at a point near the waterworks aqueduct property. From this point the line will be built to a connection with the present line at the Union station.

A new branch, called the Langdon branch, on the Western division, has been opened for business from Ensign, Alb., which is on the Calgary section, 1.5 miles from Langdon, north to Acme, 39 miles.

CONNELLSVILLE & STATE LINE.—See Western Maryland.

CUMBERLAND VALLEY.—Double-tracking work will be carried out, it is said, on the section from Hagerstown, Md., south to the Potomac river, 12 miles. The work includes building a steel bridge over the Potomac river at Falling Waters, W. Va.

DAYTON, LEBANON & CINCINNATI RAILROAD & TERMINAL CO.—This company has completed an extension from Hempstead, Ohio, north to Dayton, four miles, and the line is opened for business.

DETROIT, LANSING & GRAND RAPIDS (ELECTRIC).—Bids are wanted by F. A. Bean, chief engineer, 706 Union Trust building, Detroit, Mich., May 14, for the surveys and plans for an electric line from Brighton, Mich., southeast to a point near Detroit, about 35 miles. The work to be completed within 90 days after the signing of the contract. (April 29, p. 914.)

DOMINION ATLANTIC.—The legislature of Nova Scotia has passed a bill authorizing the Provincial government to guarantee bonds for the construction by the North Mountain Railway of a 15-mile line.

EVERETT-TACOMA.—An officer writes that this company has recorded a mortgage for \$5,000,000 to secure funds for building a line from Everett, Wash., south via Snohomish, Monroe, Tolt, Falls City, Issaquan and Renton to Seattle, about 65 miles, with a branch from this line south to Tacoma, 20 miles additional. The line is to have a grade of 1 per cent. and maximum curvature of 10 degs. O. E. Crossman, president, and Elliott Colburn, chief engineer, Snohomish. (See Everett & Tacoma, April 29, p. 1114.)

FERNWOOD & GULF.—This road is now in operation from Fernwood, Miss., east to Knoxo, 27 miles.

FORT WAYNE & SPRINGFIELD (ELECTRIC).—This company, operating a 22-mile line from Fort Wayne, Ind., southeast to Decatur, is said to have surveys made for a 28-mile extension south to Portland, Ind. The company will do the work with its own forces.

GEORGES CREEK & CUMBERLAND.—See Western Maryland.

GEORGIA, SOUTHERN & FLORIDA.—See Jacksonville, Fla., under Railway Structures.

GRAND TRUNK.—Double-tracking work is to be extended, it is said, on this road from St. Rosalie, Que., east to Richmond and Sherbrooke.

GRAND TRUNK PACIFIC.—According to press reports, this company has finished the line from Watrous, Sask., north to Prince Albert, and work was resumed recently on the Tofield-Calgary branch. A contract was let this spring to J. D. McArthur, Winnipeg, Man., for the remaining 135 miles on this branch in Alberta. (March 25, p. 850.)

GREAT NORTHERN.—According to press reports from Great Falls, Mont., this company has started condemnation proceedings for a right-of-way through Fergus county, in Montana. This is for a line to be built from Haucks siding, on the Billings & Northern, northeast to a junction with the main line of the Great Northern at a point near Mondak, Mont., about 350 miles.

GULF, COLORADO & SANTA FE.—A contract is said to have been given to the C. H. Sharp Co., Kansas City, Mo., for grade revision work on the Lampasas branch between Temple, Tex., and Lometa, 72 miles.

A contract is said to have been given to build a mile and a half of track from the yards in the northern part of Temple, Tex., to the Temple-Northwestern. It is said the Temple-Northwestern will use the Santa Fe terminal in Temple.

KANSAS CITY, MEXICO & ORIENT.—An officer writes that the company will build the branch from San Angelo, Tex., south to Del Rio, and that the National Railways of Mexico will build from Allende, Mex., north to the Rio Grande. A bridge

is to be built at this point over the Rio Grande for the joint use of both these companies. Contracts have been let by the K. C. M. & O. for grading 42 miles from San Angelo south, and this work is now under way. (March 11, p. 547.)

KANSAS, LAWTON & GULF.—An officer writes that a contract has been given to the Avery Engineering & Construction Co., Walters, Okla., for building the line from Walters south to Wichita Falls, Tex., also from Walters northeast via Duncan and Chickasha to Oklahoma City, Okla., in all about 140 miles. Fifty teams are now at work and grading has been finished on four miles. There will be four trestles. F. Avery, chief engineer and general manager, Walters. (May 6, p. 1184.)

LACLEDE, DALLAS & WESTERN.—Construction work is said to be under way between Phillipsburg, Laclede county, Mo., and Buffalo, Dallas county, 22 miles. An extension of eight miles is projected from Buffalo west. B. B. Joffe, president, and H. W. Smith, chief engineer, American Bank building, Kansas City. (April 15, p. 1016.)

MARSHALL & EAST TEXAS.—This road has been extended from Blocker, Tex., south to Elysian Fields, seven miles. (Nov. 26, p. 1037.)

An officer writes that no definite plans have yet been made for an extension of the road from Elysian Fields, Tex., south, but work on this extension will probably be carried out during 1910 if conditions are favorable. Improvements have been made to the existing line, improving the track and bridges. (Jan. 7, p. 68.)

MILNER & NORTHSIDE.—This road has been opened for traffic from Milner, Idaho, south to Oakley, 21 miles. The officers of the company are the same as those of the Idaho Southern.

MISSOURI, OKLAHOMA & GULF.—This company a short time ago sold \$3,000,000 of bonds in France. It is understood that the extension from the present northern terminus at Wagoner, Okla., north to Kansas City, Mo., will be built. The company expects to have the line finished on the southern end to Denison, Tex., by August 15. (March 4, p. 461.)

NATIONAL RAILWAYS OF MEXICO.—See Kansas City, Mexico & Orient.

NORTH DAKOTA ROADS (ELECTRIC).—According to press reports, right-of-way has been secured for an electric line from Center, N. Dak., in Oliver county, southwest to Hettinger, about 110 miles. Charles Whitmore is said to be in charge of the work.

NORTHERN ELECTRIC.—This company has filed articles of incorporation authorizing the construction of a branch from Marysville, Cal., west via Yuba City to Colusa, 30 miles. (Feb. 18, p. 380.)

NORTHERN PACIFIC.—According to press reports, construction work on the new water grade line from Tacoma, Wash., northwest via Point Defiance and the Narrows to Tenino, will be started about June 15. Bids are being asked for the work and the contract will be let about May 15. (Feb. 25, p. 429.)

NORTH MOUNTAIN.—See Dominion Atlantic.

OREGON ELECTRIC.—Franchises have been granted this company by the towns of Albany, Ore., and McMinnville. The company plans to build extensions this coming summer from Salem, south to Albany, 30 miles, and from the main line at Tigard, about 10 miles south of Portland, southwest to McMinnville, 40 miles. The work, it is understood, will include one tunnel and some heavy steel bridge work over the Santiam and Yamhill rivers. It is said that the Hill interests have bought the line.

PENINSULAR RAILWAY CO. (ELECTRIC).—According to press reports, surveys have been made for a branch from Palo Alto, Cal., east to the bay of San Francisco, about five miles.

PHILADELPHIA & SUBURBAN (ELECTRIC).—A charter has been granted this company to build elevated and subway lines in Philadelphia, Pa. Application has been made to the Philadelphia councils for a municipal franchise. As soon as the franchise is granted the work will be started on the Broad street subway. It is intended to have the line in operation

in 1913. S. S. Neff, president, 416 Franklin Bank building, and E. O. Lewis, counsel, Philadelphia. (Dec. 3, p. 1108.)

PORTLAND, GRAY & LEWISTON (ELECTRIC).—Work is under way on an electric line from Lewiston, Me., south via Auburn, Gray, West Falmouth and Deering to Portland, 35 miles. The estimated cost of the line is \$800,000. It is expected that the line will be finished during the summer of 1911. The work is being carried out by day labor. There will be two steel and eight concrete bridges, to be built by Fred T. Ley & Co., Springfield, Mass. W. S. Libby and H. M. Dingley, Lewiston, are back of the project.

PRESCOTT & NORTH-WESTERN.—This road has been extended from Helbig, Ark., north to Cox, seven miles.

ROCK ISLAND SOUTHERN.—Announcement is said to be made that through freight, passenger and express service will be started May 15 on the extension from Monmouth, Ill., north to Rock Island, Moline and Davenport, Iowa, 50 miles. (April 8, p. 971.)

ST. JOHNS RIVER TERMINAL CO.—See Jacksonville, Fla., under Railway Structures.

SCIO, LACOMBE & JORDAN VALLEY.—An officer writes that this company was organized to build from Munkers, Ore., east to Scio, thence to the Jordan valley and Lacombe, 35 miles, and that the prospects of building the line are good. There will be three bridges or tunnels and a number of station buildings. A. G. Prill, Scio, may be addressed. (April 29, p. 1115.)

SOUTHERN.—See Jacksonville, Fla., under Railway Structures.

SOUTHERN PACIFIC OF MEXICO.—The Sinaloa division has been extended from La Dura, Sonora, north to Tonichi, 18 miles.

SOUTHWESTERN NEW YORK TRACTION.—Contracts are to be let soon, it is said, for a line from Bolivar, N. Y., east to Wellsville, 15 miles. C. M. Van Curen, president; E. M. Bedford, chief engineer, Bolivar.

SPARKS WESTERN.—An extension of this road has been opened from Ellenton, Ga., northwest to Pineboro, five miles.

TEXAS ROADS (ELECTRIC).—H. M. Hyatt, representing the Empire Construction Co., St. Louis, Mo., is organizing a company in Dallas, Tex., to build an electric line from Dallas southwest to Cleburne, about 50 miles. A charter is to be secured and work started at once. The proposed route is from Dallas west via Eagle Ford to Grand Prairie, thence southwest through Webb, Mansfield, Lillian, Pleasant Point, Alvarado and Mosston, to Cleburne.

Application has been made to the city of Beaumont, Tex., for a franchise to use streets in that city for the operation of an electric street railway system and to put in an electric light and power plant. It is understood that John W. Gates, Port Arthur, is interested in the proposition, which also includes the construction of an interurban electric line from Beaumont southeast to Port Arthur, about 20 miles, for which survey has been made.

Joseph Edwards, Mansfield, Tex., is back of a project to build an electric line from Cleburne northeast to Dallas, about 50 miles.

WESTERN MARYLAND.—The Connellsville & State Line Railway Co. was recently incorporated with \$700,000 capital, to build the section of about 68 miles in Pennsylvania of the new line from Cumberland, Md., north to the Pittsburgh & Lake Erie at Connellsville, Pa. The part of the line from the Pennsylvania state line, south about 15 miles to Cumberland, Md., will be built by the Georges Creek & Cumberland, a subsidiary line of the Western Maryland. Contract for the work has been let to the Carter Construction Co., Pittsburgh. According to a report, there will be a tunnel, 2,400 ft. long, also one 1,400 ft. long, and several smaller tunnels. (April 15, p. 1017.)

WEST WASHINGTON RAILWAY & NAVIGATION CO. (ELECTRIC).—Preliminary survey is said to be made for a line from Grays Harbor, Wash., northeast towards Seattle, 77 miles. C. C. Quackenbush, president; W. B. Sammons, chief engineer, Aberdeen.

Railway Financial News.

ABBOTSFORD & NORTHEASTERN.—See Minneapolis, St. Paul & Sault Ste. Marie.

ALTOONA & BEECH CREEK.—The property of this company was sold for \$15,100 under foreclosure to H. A. Davis. The road runs from Juniata, Pa., through Wopsononock to Daugherty, 15 miles.

ATLANTA, BIRMINGHAM & ATLANTIC.—The protective committee, George C. Clark, chairman, representing the \$8,000,000 joint notes due May 1, 1910, of the Atlanta & Birmingham Construction Co. and the Atlanta, Birmingham & Atlantic Railroad, have arranged to pay the interest due on May 1 and to pay \$605,025 principal on condition that the holders of the notes surrender them and accept in payment for the remainder of the principal new 5 per cent. notes due May 1, 1912, with interest guaranteed by the stockholders of the Construction company or by the syndicate which has underwritten the \$800,000 raised from stockholders of the Construction company. The new notes are to be secured by the same collateral that now secures the old notes, and included among the present collateral are equipment bonds amounting to \$666,000, and cash amounting to \$362,000. This cash may be applied to paying new notes and canceling them if the present plan becomes effective. The equipment bonds are to be sold. The cash to be provided by the Construction company and by the sale of collateral will, it is expected, permit a pro rata payment of about 20 per cent. on account of the principal of the old joint notes.

BALTIMORE & OHIO.—The company has sold to Kuhn, Loeb & Co., New York, \$40,000,000 three-year notes to pay for new equipment, construction and betterments.

BEECH CREEK RAILROAD.—W. C. Brown, Rembrandt Peale, E. V. W. Rossiter and R. A. Shillingforth have been elected directors, succeeding W. K. Vanderbilt, H. McK. Twombly, W. D. Kelly and James Kerr, resigned.

BUFFALO & SUSQUEHANNA RAILROAD.—Interest on the \$9,510,000 4 per cent. bonds of the Buffalo & Susquehanna Railroad, which is leased by the Buffalo & Susquehanna Railway, will, it is understood, be defaulted on July 1, and the 4 per cent. guaranteed dividend on the stocks of the Railroad company will not be paid, thus breaking the lease of the Railroad to the Railway company. In view of the appointment of a receiver for the Railway company, as announced in these columns last week, a protective committee for the Railroad company bondholders has been formed. This committee consists of Alvin W. Krech, chairman; John L. Billard, James S. Kuhn, Robert Windsor and Asa S. Wing. The committee ask the deposit of first refunding 4 per cent. bonds with the Equitable Trust Co., New York.

CENTRAL NEW ENGLAND.—The Philadelphia committee, C. S. W. Packard, chairman, for the minority 5 per cent. general mortgage bondholders has made a settlement for the (approximately \$500,000) bonds they represent. These bonds are to be paid for in cash at par.

CHICAGO & ALTON.—In connection with a statement that the company is to issue \$18,000,000 bonds, a director is quoted as saying that "the Alton has, through lack of facilities, been unable to handle more than 60 per cent. of the business it has been offered, and the need of a security issue that will provide greater transportation power is easily apparent. * * * It will be eight years before all of the \$18,000,000 is spent." It is said that only \$3,500,000 of the new bonds will be issued this year.

CHICAGO, MILWAUKEE & ST. PAUL.—The possibility of the sale of new securities abroad, mentioned in the Late News columns last week, has been unofficially confirmed, and it is understood that the company has nearly concluded negotiations with Kuhn, Loeb & Co., New York, for the sale of \$50,000,000 15-year 4 per cent. debenture bonds.

Holders of Milwaukee & Northern first mortgage bonds due June 1, 1910, are offered the privilege of extending their bonds at 4½ per cent. for three years, with the first mortgage lien to remain unimpaired. Holders of bonds who do not wish to extend them will be paid in cash at par.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—The sale of 50,000,000 francs (\$10,000,000) 4 per cent. debentures in Paris through J. P. Morgan & Co. has been confirmed.

DELAWARE & HUDSON.—Robert C. Pruyn has been elected a director, succeeding Dumont Clarke, deceased.

DENVER, LARAMIE & NORTHWESTERN RAILROAD.—This company has taken over the Denver, Laramie & Northwestern Railway, and has made a mortgage to secure an authorized issue of \$22,500,000 first mortgage 5 per cent. bonds of April 1, 1910-1940. The bonds are to be issued at \$30,000 per mile to pay for building 750 miles of road. The authorized capital stock of the company amounts to \$30,000,000. The D., L. & N. Railway bonds, issued to pay for 56 miles of road between Denver, Colo., and Greeley, are to be called for payment at 102.

MEMPHIS, DALLAS & GULF.—See Memphis, Paris & Gulf.

MEMPHIS, PARIS & GULF.—Stockholders are to vote May 16 on the question of increasing the authorized capital stock from \$640,000 to \$6,260,000, and on the question of authorizing an issue of \$6,260,000 5 per cent. 30-year bonds, and on the question of changing the name of the company to Memphis, Dallas & Gulf. The road runs from Murfreesboro, Ark., southwest to Ashdown, 41 miles. There is now outstanding \$640,000 20-year 6 per cent. bonds, of which \$420,000 are guaranteed principal and interest by the Nashville Lumber Co. Of the new 5 per cent. bonds, \$840,000 are to be reserved to retire the bonds now outstanding.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—The Abbotsford & Northeastern, running from Athens, Wis., to Abbotsford, 15 miles, has been taken over by the Soo and is now operated as a branch of the Chicago division.

MISSOURI, KANSAS & TEXAS.—Speyer & Co., New York, have bought \$10,000,000 of a new issue of 4½ per cent. debenture bonds.

NATIONAL RAILWAYS OF MEXICO.—The \$125,000,000 second preferred stock of the National Railways of Mexico has been placed on the official list of the Paris Bourse (Parquet).

NEW YORK CENTRAL & HUDSON RIVER.—See an item in regard to this company in Court News.

NORFOLK SOUTHERN RAILROAD.—The Corporation Commission of Virginia has granted a charter to this company, which is the successor of the Norfolk & Southern Railway.

OREGON ELECTRIC.—Control of this company has been bought by James J. Hill and associates. The company has outstanding \$1,950,000 common stock, \$160,000 6 per cent. cumulative preferred stock and \$2,000,000 first mortgage bonds of 1908-1933. The road runs from Portland, Ore., to Salem, 49 miles, and from Garden Home to Forest Grove, 21 miles.

QUAKERTOWN & EASTERN.—The property of this company was sold for \$10,000 under foreclosure on May 6 to C. C. Harring, representing the bondholders. The road runs from Quakertown, Pa., to Riegelsville, 19 miles. No trains have been run, it is said, over the road for five years.

ST. LOUIS, BROWNSVILLE & MEXICO.—The Texas Railroad Commission has authorized the company to issue \$7,256,000 bonds under the new mortgage. The valuation of the road as fixed by the commission is \$10,726,380.

SOUTHERN RAILWAY.—The company has sold a block of development and general mortgage 4 per cent. bonds of 1906-1956 in Germany, through J. P. Morgan & Co., New York.

UNITED RAILWAYS (PORTLAND).—The control of this company has been bought by James J. Hill and associates.

WABASH-PITTSBURGH TERMINAL.—Kuhn, Loeb & Co. and Blair & Co., both of New York, who have been the bankers in charge of the Wheeling & Lake Erie and the Wabash-Pittsburgh Terminal reorganizations, have decided not to try to keep the two companies together in a common reorganization plan, and will concern themselves only with the reorganization of the Wheeling & Lake Erie, leaving the reorganization of the Terminal company to the Terminal company's bondholders' committee.

WHEELING & LAKE ERIE.—See Wabash-Pittsburgh Terminal.

Supply Trade Section.

The Mather Horse & Stock Car Co., Chicago, has moved its office from 1320 Marquette building to 501 People's Gas building.

The Hurley Track Laying Machine Co., Chicago, has moved its office from the Railway Exchange building to 1408 Fisher building.

The Thomson-Thomson Co., Philadelphia, Pa., will, on May 15, move its offices to 509 Bulletin building, northeast corner of City Hall square.

The Adreon Mfg. Co., St. Louis, Mo., has moved its Chicago sales office from the Western Union building to the McCormick building, 193 Michigan avenue.

The Gulick-Henderson Co., inspecting engineers, New York, announces that F. B. Morse has been appointed assistant to the president, succeeding T. W. Cohill, resigned.

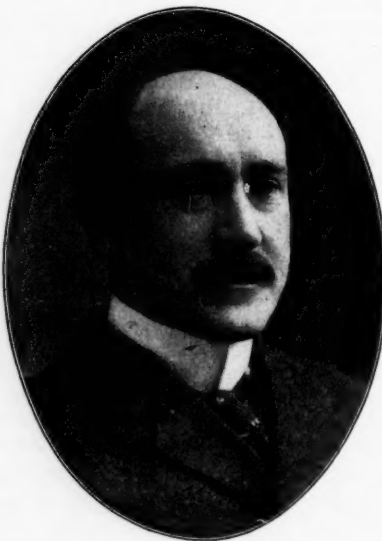
The McKeen Motor Car Co., Omaha, Neb., has completed a 70-ft. motor car for the Buffalo, Rochester & Pittsburgh. It was shipped from Omaha May 6, via the Wabash.

The Chicago sales office of the Pennsylvania Steel Co., Steelton, Pa., and the Maryland Steel Co. has been moved to suite 1005-1007 McCormick building, 193 Michigan avenue.

The Illinois Steel Co., Chicago, has made a large addition to its warehouse at the north works in Chicago. A two-story addition to the office building has also been completed.

The Cement Products Exhibition Co., 115 Adams street, Chicago, has announced that the New York cement show will be held in the Madison Square Garden December 14-20, 1910, and the Chicago show in the Coliseum, February 17-23, 1911. A general prospectus of both these exhibitions is now being prepared which will give complete information for exhibitors, including diagrams of space available.

Walter C. Kerr, president of Westinghouse, Church, Kerr & Co., New York, died on May 8 at Rochester, Minn., to which place he had gone to undergo an operation. He had been actively engaged with the affairs of the company up to the time of his going west on March 1. Mr. Kerr was born at St. Peter, Minn., on November 8, 1858. He was educated in the public schools of that town and later went to Cornell University, where he was graduated in mechanical engineering in 1879. He was subsequently an instructor and also an assistant professor, until 1883, in the Sibley College of Mechanical Arts, after which he became allied with the Westinghouse interests. His life work was in connection with the engineering organization of which he was president for many years and of which he was an officer from its organization in 1884. His forceful personality and gift of organization was responsible for the development of Westinghouse, Church, Kerr & Co. from its small beginning to its present place in the engineering operations of the world. Mr. Kerr was a trustee of Cornell University since 1890 and also a member of Cornellian council recently formed to raise money for the university. He was a member of the American Institute of Electrical Engineers, the Canadian Society of Civil Engineers, the American Society of Mechanical Engineers, New York Railroad Club, Psi Upsilon Club, Duquesne Club of Pittsburgh, New York



W. C. Kerr.

Yacht Club, the Seawanhaka Corinthian Yacht Club, the Richmond County Country Club and the Franklin Institute. Mr. Kerr's home is at Beeches, in Dongan Hills, Staten Island, N. Y.

RAILWAY STRUCTURES.

ABILENE, TEX.—The Texas & Pacific has started work on its new passenger station, which was mentioned in the *Railway Age Gazette* of November 26. Negotiations have been carried on for the building of a union station, but no decision has been reached.

BETHLEHEM, PA.—The Lehigh Valley Transit Co. has bought land as a site on which it will build a steel structure, to cost \$100,000, for a north approach to the New street bridge.

CHEBOYGAN, MICH.—The Detroit & Mackinac is to petition the county supervisors for the right to bridge the Cheboygan river.

FALLING WATERS, W. VA.—See Cumberland Valley under Railway Construction.

FORT WILLIAM, ONT.—The contract for building additions to the Canadian Pacific machine shops at Fort William, Ont., is said to have been given to M. H. Braden, Fort William. (April 22, p. 1069.)

GALVESTON, TEX.—The Gulf, Colorado & Santa Fe has given contracts to the Union Bridge & Construction Co., Kansas City, Mo., for the construction of two concrete and steel bridges on the Lometa-Brady extension.

GLENDON, PA.—A contract has been given to S. W. Chiles, South Bethlehem, Pa., for putting up a steel highway bridge, 130 ft. long, over the Lehigh Valley tracks and the canal. The bridge will cost \$15,575.

GROSSE ISLE, MICH.—The Grosse Isle Railroad has been organized in Michigan, with \$50,000 capital, to build a bridge to carry street railway cars from the mainland to Grosse Isle. The incorporators include: K. B. Alexander, E. Voight, W. E. Brown and H. L. Wilton.

IDAHO FALLS, IDAHO.—According to press reports, the Oregon Short Line will build a bridge over the Snake river.

JACKSONVILLE, FLA.—A large amount of work is to be carried out by the St. Johns River Terminal Co., improving the terminal facilities at Jacksonville for the Southern Railway and the Georgia, Southern & Florida. Increased facilities for the handling of traffic will cost \$250,000, on which work is now under way. The plans call for enlarging the freight yards north of Bay street between Catherine and Marsh streets, additional property adjoining the yards having recently been bought for this purpose. The tracks south of Bay street along the river front between Catherine and Maine streets are to be enlarged and rearranged. The Clyde Steamship Co. is to build large piers and terminals along the river front between Market and Washington streets, plans for which have been made. A large warehouse is also to be built for import and export traffic. Land has been bought as a site on which shops are to be built for the Southern Railway, the Georgia, Southern & Florida and the St. Johns River Terminal Co. J. B. Munson is president of the St. Johns River Terminal Co. (November 19, p. 995.)

KANSAS CITY, MO.—The Missouri & Kansas Terminal Building Co. has been formed to build a \$2,000,000 union electric railway station in Kansas City. The building is to be of stone construction, two stories high. W. B. Strang, president, Kansas City.

LORAIN, OHIO.—Contracts have been let by the Baltimore & Ohio for improvements to the dock and ore handling facilities at Lorain, to cost \$500,000. James Stewart & Co., New York, has the contract to erect the docks, also for the machinery for handling the ore, and to construct a storage yard. The Great Lakes Dredging Co., Cleveland, Ohio, will do the dredging

work. The ore handling machinery will be supplied by the Brown Hoisting Co. The power house will be 73 ft. x 121 ft., instead of 70 ft. x 90 ft., as originally planned, and will be built by P. Farrell, Cincinnati. Work on the improvements will be started at once. (April 15, p. 1020.)

MARSHALL, TEX.—Work is said to have been started by the Marshall & East Texas on new shops in the southern part of Marshall. There will be eight buildings, including a round-house and an improved coal chute. (Jan. 21, p. 168.)

MIDVALE, OHIO.—The Northern Ohio Traction & Light Co. is to build a new power house with a probable capacity of 6,000 k.w.

NEW YORK.—The New York Public Service Commission, First district, advises the Board of Estimate that it is desirable to postpone the proposed enlargement work at the Centre street subway station in the borough of Manhattan, changing the station from a four-track to a six-track station. The Board of Estimate has already appropriated \$875,000 for changes in stations, and it would require \$1,500,000 to pay for additional land should the six-track station be built at Centre street.

NORTH BRANCH, MINN.—The Northern Pacific is receiving bids for building an equipment building and a machine shop. The cost of the two buildings is estimated at \$58,000.

PARIS, TEX.—The Gulf, Colorado & Santa Fe and the Paris & Great Northern have reached a satisfactory agreement with the citizens of Paris concerning the proposed union station, mentioned in the *Railway Age Gazette* of August 13, 1909.

PORTLAND, ME.—See Portland, Gray & Lewiston (Electric) under Railway Construction.

PORTLAND, ORE.—See Oregon Electric under Railway Construction.

PRAIRIE VIEW, TEX.—The railroad commission has approved plans for a new passenger station for the Houston & Texas Central.

RITZVILLE, WASH.—The Northern Pacific has let the contract for building a \$15,000 passenger station mentioned in the *Railway Age Gazette* of March 4.

ROCKFIELD, QUE.—The Railway Commission of Canada has ordered the construction of a bridge at Rockfield over the tracks of the Grand Trunk and the Montreal Park & Island Railway.

SAVANNAH, GA.—It is expected to have the additions now being made to the Central of Georgia's office building in Savannah completed by June 15. The cost of the improvements is \$45,000.

The Gadsden Contracting Co. has finished the work of building the foundation for the 13,000-ft. trestle across the Savannah river, 14 miles from Savannah. It is expected to have all the work finished by July 1.

SAVANNAH, N. Y.—The New York Public Service Commission, Second district, has ordered the Rochester, Syracuse & Eastern to build a station at Savannah, in Wayne county. The company must submit plans for the new station by May 30 and have the work finished by October, 1910.

SPRINGFIELD, MO.—The Missouri Pacific has let the contract for building a \$45,000 passenger station to be located on Water street between Jefferson and Benton streets.

TORONTO, ONT.—An officer of the Grand Trunk writes that some bridges are to be built in connection with the general separation of grades through the city of Toronto. The date for asking bids for the work has not yet been determined.

WICHITA FALLS, TEX.—The railways entering this place are said to have plans made and will spend a large amount of money for new buildings in Wichita Falls. The improvements include shops, roundhouses, office buildings and freight terminals.

WILKESBARRE, PA.—Plans are being made by the city officials and representatives of the railway companies entering Wilkesbarre for the removal of grade crossings in that city. The question of putting up a union passenger station is also under consideration.

Late News.

The items in this column were received after the classified departments were closed.

The Oregon Short Line is planning to build a viaduct over its yards from the east to the west side of Pocatello, Idaho.

The Chicago, Milwaukee & St. Paul will spend \$1,500,000 elevating 2½ miles of the line on Bloomingdale avenue, Chicago.

Llewellyn A. Shaver, solicitor for the Interstate Commerce Commission, died suddenly at his residence in Washington, D. C., on May 11, from heart disease.

The Union Pacific has arranged to install wireless telegraph stations at Cheyenne, Wyo., and Sidney, Neb., for train despatching. It has not arranged for the intermediate stations.

The sale of the International & Great Northern under foreclosure of the second and third mortgage has been ordered. The question of priority of claims is reserved to be determined later.

The Chicago, Milwaukee & St. Paul, reported in the *Railway Age Gazette* of April 22 as being in the market for 25 Mallet locomotives, has ordered this equipment from the American Locomotive Co.

The Philadelphia & Reading is planning to make improvements, it is said, in Reading, Pa., to include a new station at Olney street, enlarging the freight station and the removal of the car shops further north.

The Rome & Northern will be opened for passenger traffic May 15, from Rome, Ga., north to Gore, 20 miles. The company proposes to immediately build an extension from Gore northeast to Tunnel Hill, 33 miles.

The New York State Railways and the Mohawk Valley Co. have each declared initial dividends of 1½ per cent. on their common stock, payable July 1. Control of both companies is held by the New York Central & Hudson River.

Sir Thomas Shaughnessy, president of the Canadian Pacific, has been elected also chairman of the board of directors, succeeding Sir William Van Horne, resigned. A. R. Creelman has been elected a director, succeeding Sir George Drummond, deceased.

The Chicago & Northwestern has ordered 75 locomotives of various types from the Baldwin Locomotive Works and the American Locomotive Company. Information as to the exact division between the companies is not obtainable at this time.

The New York Public Service Commission, First district, has extended the time to June 15, 1911, for the completion of the subway extension of the Hudson & Manhattan subway under Sixth avenue, from Twenty-third street to Herald square, in the borough of Manhattan, New York City.

The New York Public Service Commission, Second district, has served on the New York, New Haven & Hartford the complaint of William P. Hickok and Buell G. Tallman against the increase in commutation rates between Mount Vernon and the city of New York. The company has been required to make answer within ten days.

Passenger officials of the Central of New Jersey say that an increase in both passenger and freight rates is contemplated. They say, however, that anything definite as to the ratio of increase will not be given out within ten days or two weeks. At the Lehigh Valley offices it was stated that no such change would be put into effect within the next few months.

The Indiana Railroad Commission has denied the petition of the Grand Rapids & Indiana Railway Company to be relieved from complying with the general order requiring all railways having specified minimum earnings to adopt the block system. The company represented that its earnings were only slightly in excess of the minimum specified, and that while the company had the money on hand to install the block signals, it believed greater safety could be assured by using the money for betterments in other things. The commission, however, refused to grant the relief asked for.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Grand Trunk is said to be figuring on 50 locomotives. This item is not confirmed.

The Scio-Lacombe & Jordan Valley advises that it will buy motive power within 60 days. A. G. Prill, president, Scio, Ore.

The Atlantic Coast Line has ordered 10 ten-wheel passenger, six 10-wheel freight, six consolidation and seven switching locomotives from the Baldwin Locomotive Works.

The Chicago, Burlington & Quincy, reported in the Railway Age Gazette of March 11 as in the market for 25 switch locomotives, has authorized the building of these engines at company shops. Inquiries are now out for 50 Mikado locomotives.

The National Railways of Mexico, as reported in the Railway Age Gazette of April 29, have ordered 14 Mallet locomotives from the Baldwin Locomotive Works.

General Dimensions.

Weight on drivers	300,000 lbs.
Total weight	338,000 lbs.
Cylinders	33 in. x 32 in.
Diameter of drivers	56 "
Type of boiler	Straight top
Working steam pressure	220 lbs.
Heating surface, tubes	4,310 sq. ft.
" firebox	210 "
" " total	4,520 "
Tubes, number	350
" outside diameter	2 1/4 in.
" length	21 ft.
Firebox, length	124 in.
" width	78 "
" material	Steel
Grate area	67.1 sq. ft.
Water capacity	9,000 gals.
Fuel oil capacity	4,000 gals.

Special Equipment.

Brakes	Westinghouse
Couplers	Simplex
Headlight	Pyle-National Electric
Injector	Nathan
Sanding devices	Leach
Sight-feed lubricators	Nathan
Springs	Railway Steel Spring Co.
Staying	Falls Hollow
Steam gages	American Steam Gage & Valve Co.
Tubes	Mannessman (Germany)
Valves	Hobart Allfree

The Norfolk & Western, as reported in the Railway Age Gazette of April 29, has ordered 10 class M-2 locomotives from the Baldwin Locomotive Works.

General Dimensions.

Weight on drivers	220,000 lbs.
Total weight	260,000 lbs.
Cylinders	24 in. x 30 in.
Diameter of drivers	56 in.
Boiler, type	Wagon top
Boiler, working steam pressure	200 lbs.
Heating surface, tubes	4,281 sq. ft.
" firebox	179 "
" " total	4,460 "
Tubes, number	386
Tubes, outside diameter	2 1/4 in.
" length	18 ft. 10 "
" material	Carbon steel
Firebox, type	Radial stay
" length	.99 1/2 in.
" width	.64 1/2 "
" material	Crucible steel
Grate area	45 sq. ft.
Tank capacity	9,000 gals.
Coal capacity	14 tons

Special Equipment.

Boiler lagging	Sectional manganese
Brakes	Westinghouse-American
Brake-beams	N. & W. standard
Couplers	M. C. B.
Driving boxes	Steeld cast-iron
Headlight	16 in. oil burners
Injector	Monitor
Journal bearings	Brady Brass Co.
Piston and valve rod packings	U. S. Metallic
Safety valve	Ashton
Sanding devices	Leach
Sight-feed lubricator	Nathan
Springs	Union Spring & Mfg. Co.
Tires	Latrobe
Valve gear	Walschaerts

The Baltimore & Ohio, reported in the Railway Age Gazette of April 22 as having ordered equipment, has ordered 95

simple consolidation locomotives from the American Locomotive Co.

General Dimensions.

Weight on drivers	198,580 lbs.
Total weight	220,300 lbs.
Cylinders	22 in. x 30 in.
Diameter of drivers	60 "
Type of boiler	Straight
Working steam pressure	205 lbs.
Heating surface, tubes	2,668.46 sq. ft.
" firebox	179.30 "
" " total	2,847.76 "
Tubes, number	324
" outside diameter	2 in.
" length	15 ft. 8 3/4 "
Firebox, type	Wide
" length	107 1/2 in.
" width	75 1/2 "
Grate area	57.05 sq. ft.
Water capacity	7,000 gals.
Coal capacity	15 tons

Special Equipment.

Axles	O. H. steel
Brakes	Westinghouse No. 6 E. T.
Brake-beams	Diamond special
Driving boxes	Elvin
Headlight	Schroeder
Injector	45 Simplex, 50 Hancock
Journal bearings	Brass
Piston and valve rod packings	U. S. Metallic
Safety valve	Two 4-in. Coale
Sanding devices	Hanlon
Sight-feed lubricators	Nathan
Springs	B. & O. specifications
Staying	Radial
Steam gages	Ashcroft
Steam heat equipment	Gold
Tires	Standard
Tubes	Seamless steel
Valve gear	Walschaerts
Wheel centers	Cast steel

CAR BUILDING.

The Baltimore & Ohio has issued inquiries for 1,000 box cars.

The Illinois Traction Company is in the market for 14 interurban cars.

The Nashville, Chattanooga & St. Louis is building 200 box cars at company shops.

The Argentine Government Railway is in the market for 118 passenger cars of various types.

The Western Maryland is said to be figuring on 600 freight cars. This item is not confirmed.

The Chicago Short Line expects to order 10 to 15 fifty-ton general service cars in a short time.

The Scio-Lacombe & Jordan Valley advises that it will buy rolling stock within 60 days. A. G. Prill, president, Scio, Ore.

The Illinois Traction System is reported in the market for 21 city cars for the Chicago, Ottawa & Peoria. This item is not confirmed.

The Metropolitan Street Railway, Kansas City, Mo., is said to be in the market for 25 electric cars at once. This item is not confirmed.

The Los Angeles Ry., Los Angeles, Cal., reported in the Railway Age Gazette of April 1 as in the market for 90 electric cars, has ordered this equipment from the St. Louis Car Co.

The Mexico Northwestern, reported in the Railway Age Gazette of April 8 as in the market for 200 box cars and 60 stock cars, is reported to have ordered the box cars from the Pullman Co.

The Toledo, St. Louis & Western, reported in the Railway Age Gazette of November 19, 1909, as in the market for 750 box cars, which inquiry was later withdrawn, is again asking prices on this equipment.

The Utah Light & Railway Co., Salt Lake City, Utah, reported in the Railway Age Gazette of April 29 as in the market for 12 interurban and 12 city cars, has ordered this equipment from the St. Louis Car Co.

The Colorado & Southern, reported in an unconfirmed item in the Railway Age Gazette of April 22 as building freight cars at the Denver shops, has under construction 150 narrow gage box, 50 narrow gage coal and 50 narrow gage stock cars, also 15 standard gage caboose cars.

The Harriman Lines passenger equipment order to the Pullman Company, including 424 cars, as reported in the *Railway Age Gazette* of April 29, will be divided as follows: 189 coaches, 87 chair, 59 baggage, 35 postal, 25 dining, 12 observation, 16 baggage and postal and one passenger baggage and mail. Excepting the diners and observation cars, this equipment will have all-steel underframes and all-steel bodies. The Oregon Short Line will receive 56 coach, 10 chair, five baggage, five postal, six diner and five combination cars; the Union Pacific will receive five diners; the Oregon Railway & Navigation will receive two postal, eight baggage, four combination, two chair and 12 coaches. The Oregon & California will receive four postal, six baggage, five combination and 10 coaches; the Central Pacific will receive 38 coaches, 30 chair, 10 baggage, 11 postal, five diner and five observation cars; the Southern Pacific will receive 58 coaches, 45 chair, 25 baggage, nine postal, seven diner and seven observation cars; the Arizona Eastern will receive one passenger and mail car; the Oregon & Washington will receive 15 coaches, five baggage, four postal, two diner and two combination cars.

MACHINERY AND TOOLS.

The Kansas City, Mexico & Orient is in the market for three or four machine tools.

IRON AND STEEL.

The Philadelphia & Reading has ordered 200 tons of bridge steel from the McClintic-Marshall Construction Co.

The New York Central has ordered 600 tons of structural steel from the Lackawanna Bridge Co. for its Buffalo, N. Y., freight sheds.

The Southern is reported to have ordered 10,000 tons of rails from the Maryland Steel Co. in addition to the order reported in the *Railway Age Gazette* of March 25.

The Central of New Jersey, reported in the *Railway Age Gazette* of April 22 as in the market for 200 tons of bridge steel, has ordered 300 tons from the Phoenix Iron Works.

The New York, New Haven & Hartford, reported in the *Railway Age Gazette* of April 22 as in the market for 2,000 tons of bridge steel, has ordered this material from the American Bridge Company, and has also ordered 1,100 tons from the Boston Bridge Co.

General Conditions in Steel.—Orders for railway steel during the past week have been light. Reports indicate that tenders have been made for 50,000 tons, of which scarcely 15,000 tons have been placed. In industrial lines, however, there is said to be about 200,000 tons in inquiries, and the estimating departments of the fabricating shops are very busy on these prospective contracts. The United States Steel Corporation at the present time is operating between 80 and 85 per cent. of its capacity. This means a reduction in output between 10 and 15 per cent., as the Steel Corporation has at no time since the recovery in steel operated its mills in excess of 95 per cent. of capacity.

SIGNALING.

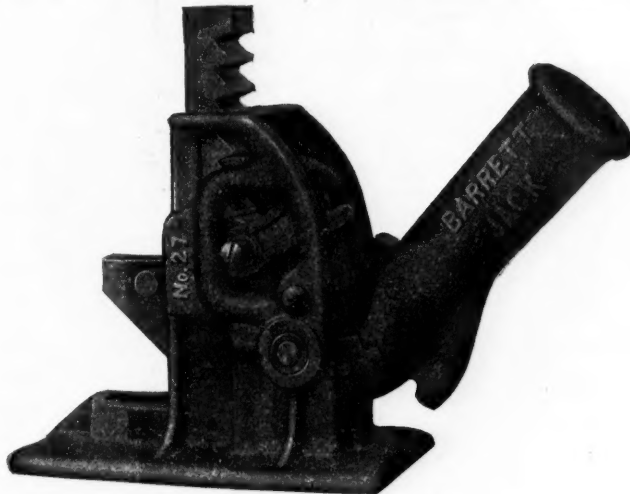
The Chicago Great Western will buy all the signals and relays to equip its tracks from Chicago to Oelwein from the General Electric Co.

The Rock Island has just completed the installation of automatic block signals between Valley Junction and Neola, on the Iowa division, 116 miles of single track. There are 136 signals and three crossing bells. All signals work in the upper right-hand quadrant, giving indications in three positions. Switch indicators are used at switches remote from signals. In these and in all other respects this installation conforms to standard Rock Island practice as heretofore described. The signals, indicators and relays were furnished by the Union Switch & Signal Co.

A New Design Track Jack.

A new Barrett track jack, designed especially for use on the electrical zone of the New York Central, by the Duff Manufacturing Co., Pittsburgh, Pa., is shown herewith. The jack is intended especially for use outside the track on the third rail side.

The new jack, weighing 55 lbs., is much shorter than other track jacks, its height when closed being 10 in., with a 5½-in. lift. When the base of the rail rests on the toe of the rack, the top of the rack is level with the top of the rail, and there



Barrett Track Jack.

is sufficient clearance between the track and rail to permit the car wheel flanges to pass. When it is necessary to stop work on the track to permit a train to pass, the jack can be quickly dropped and the wooden handle removed from its socket. The socket drops down out of the way and the jack can be left under the rail while the train is passing. There should be a considerable saving in time in not having to remove and reset the jack every time a train passes, and especially so where the trains are frequent.

Composition and Action of Abrasives.

The department of tests of the Norton Company, Worcester, Mass., recently made a study of natural abrasives and artificial aluminous abrasives and their effects in dry and wet grinding. Some of the conclusions of these investigations are given herewith.

The efficiency of aluminous abrasive materials used in the manufacture of grinding wheels depends largely on purity and structure. The accompanying illustrations are microphotographs of aluminous abrasives in the grain and characteristic chips made during a grinding operation. Aluminous abrasives are those which depend for their abrasive action on their alumina content. The purity and structure are plainly shown under the microscope.

The chief impurities, or foreign minerals that are detrimental, are oxides of iron and titanium and silica. In some cases these foreign minerals are merely intermixed with the abrasive and can easily be separated mechanically. In other cases the impurities or foreign minerals are chemically or mechanically combined with the abrasive grain. Purification of the latter forms of impure abrasives is practically impossible. All commercial forms of natural abrasives have impurities or foreign material of this class to a greater or less degree.

In all aluminous abrasives, the abrasive efficiency is directly proportional to the amount of crystalline alumina present. When silica is combined with alumina it makes a brittle grain of weak structure which is not a satisfactory abrasive. When iron oxides are present the grain lacks the necessary abrasive qualities. The tendency of such a wheel is to heat or burn the material being ground and consumes a great deal of horse power.

Fig. 1 shows some grains of Naxos emery as they appear

under the microscope. This carries considerable quantities of impurities or detrimental minerals. This form of abrasive material may be likened to a sponge whose voids have been filled with impurities. The abrasive shown in Fig. 2 has only a small amount of combined impurities and no mechanically mixed impurities. In the latter illustration a tendency to-



Fig. 1—Naxos Emery Grain, 50 Per Cent. Crystalline Alumina.

ward crystallization is evident, whereas in Fig. 1 the abrasive grains are entirely amorphous. The shape of the grain in Fig. 1 is not as good for abrasive purposes, being more round or blunt and is without the sharp cutting edges of the other.

Natural abrasives seldom run above 85 per cent. in crystalline alumina and those that run as high as 80 per cent. or over are considered an exceptional grade. The common emery

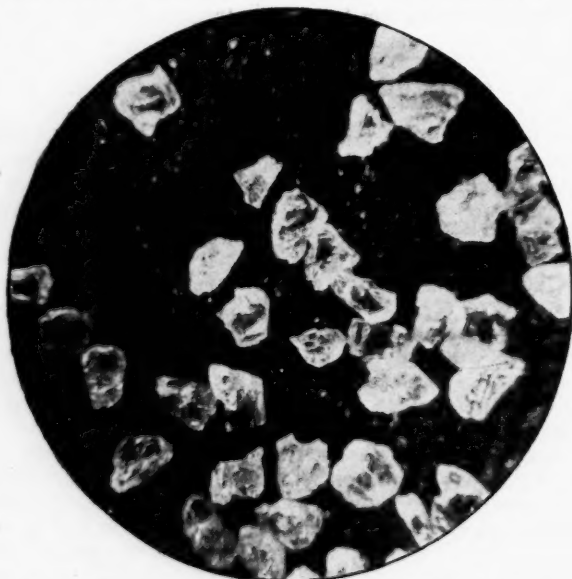


Fig. 2—Alundum Grain, 92 to 98 Per Cent. Crystalline Alumina.

in use runs only as high as 40 to 50 per cent. in crystalline alumina. In the artificial aluminous abrasives it is possible to get any degree of purity desired. The purity depends on the electric furnace treatment. Alundum runs from 92 to 98 per cent. pure alumina.

One of the chief requisites of a grinding wheel is its ability to remove stock without changing the temperature to the extent of injuring the material ground. In Figs. 3 and 4 two lots of grinding chips as they appear under the microscope are shown. One lot of chips, Fig. 3, was caught under a grinding wheel made of an abrasive material such as shown

in Fig. 1. The other lot, Fig. 4, was caught under a grinding wheel made of an abrasive material of a high degree of purity. The material ground was the same, under the same conditions.

It is not the intention to infer that the cutting properties of a wheel depend entirely on the abrasive used in its manufacture. There are many conditions that should be consid-

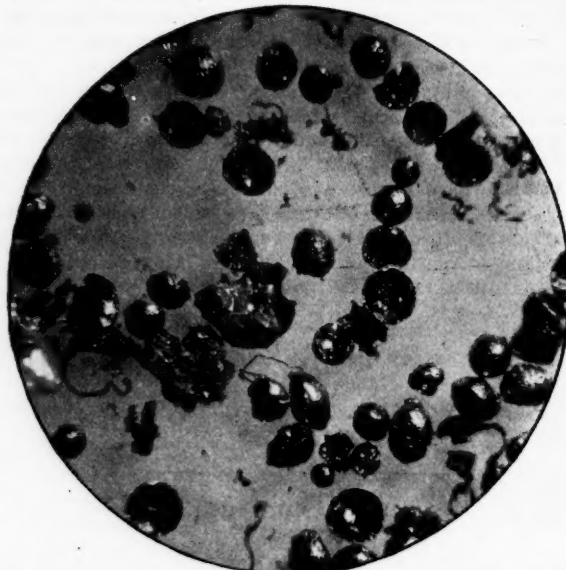


Fig. 3—Manganese Steel Chips, Produced by Dry Grinding with an Emery Wheel.

ered: for example, grade of hardness. Fig. 3 shows that there was so much heat generated that portions of the chips were melted as indicated by the globules shown in the picture. Fig. 4 shows more perfect chips produced with a cool cutting wheel. The microscope shows them to be clearly shavings identical with the cuttings of steel tools, except that there are many different shapes, widths and lengths due to the fact



Fig. 4—Manganese Steel Chips, Produced by Dry Grinding with an Alundum Wheel.

that the cutting points of the grinding wheel are of different shapes and angles of clearance.

A wheel that produces great heat in grinding should be avoided, not only for the reason that it would have a tendency to injure the metal being ground, but it is evident that it consumes a great deal more power and will not produce as much work in a given time as a wheel that grinds with less friction. The most efficient grinding wheel is one that will cut off the most stock in a given time and with the least horse power. The power consumed by grinding machines is rarely considered by superintendents and works managers.